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ORAL PRESENTATION

A Retrospective Investigation for Stiffness of Hamstring Muscles in Athletes with and without Anterior Cruciate Ligament Injury History

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Objective: Hamstring strain injuries (HSIs) are common in sports involving running, jumping, and kicking. Increased passive stiffness of the hamstrings is a known structural risk factor for HSIs. A recent meta-analysis identified a 70% increased risk of HSIs in athletes with a history of anterior cruciate ligament (ACL) injury. The study recommended future research focus on the interactions between HSI risk factors. This study aimed to retrospectively compare passive hamstring stiffness in male athletes with and without ACL injury history. **Methods:** Passive muscle stiffness of the biceps femoris long head, semimembranosus, and semitendinosus was measured using ultrasound-based shear-wave elastography. Comparisons were made between athletes with (age 24 ± 4.2) and without (age 19.7 ± 2.1) ACL injury history. Measurements for the injured group were taken 13.8 ± 7.1 months post-ACL reconstruction. The control group consisted of athletes aged 18–35, with no known lower extremity injury history, performing the same sports as the injured group. **Results:** There were no significant differences in the stiffness values of the biceps femoris long head, semimembranosus, and semitendinosus muscles between the groups. **Conclusion:** No significant differences in passive mid-muscle belly stiffness were found between previously injured and uninjured athletes. Future studies should examine other parts of the muscles. The retrospective design limits the ability to determine the relationship between HSI risk and muscle stiffness, necessitating a prospective study.

Swimming Performance in Sprint and Distance Events Among Southeast Asian Age Group Swimmers: A cross-sectional study

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Objectives: Growth may affect swimming performance in sprint and distance events, but its impact remains unknown among Southeast Asian (SEA) swimmers. This study aimed to examine the influence of age on sprint and distance swimming performance among SEA age group swimmers. **Methods:** A total of 128 swimmers (64 males, 64 females) who participated in the final top eight race times of sprint events (100 m freestyle) and distance events (400 m freestyle) at the SEA Age Group Championship 2023 (<13, 14–15, 16–18) and SEA Games 2023 were included. Their times were converted into swim points based on the FINA 2023 standard. Analysis was conducted using 2×4 repeated measures ANOVA in IBM SPSS Statistics for Windows version 26.0 (Armonk, NY: IBM Corp) to compare independent variables (events and age groups). A significance level of <0.05 was set. **Results:** Data revealed significant improvements in swimming performance across age groups from <13 years old to 16–18 years old, and up to the SEA Games level, in both events ($P < 0.001$). Male endurance performance was significantly higher compared to sprint performance at <13 ($P < 0.01$), while female endurance performance was significantly lower at the SEA Games level ($P < 0.01$). **Conclusion:** Sprint and distance swimming events exhibit a similar performance progression trend. However, sprint performance outperforms endurance events after the peak height velocity.

Using a Pneumatic Exercise Machine for Muscular Power Among National Seated Shot Putters

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Objective: Muscular power is crucial in sports training, but para-athletes may encounter unique challenges due to individual-specific needs and abilities. Certain pneumatic exercise machines offer adjustability suitable for para-athletes to train and monitor power gains effectively. This study aims to investigate the potential benefits of muscular power training among seated shot putters using a pneumatic machine. **Methods:** Three Malaysian national para-athletes (average distance throw: 8.9 ± 0.7 m, age: 27.3 ± 2.1 years, height: 168.7 ± 7.5 m, weight: 89.7 ± 10 kg) underwent two power assessments six weeks apart. They followed a stepwise exercise program simulating shot put movements with pneumatic resistance, with resistance increasing as work decreased over approximately 12 sessions, alongside regular field training. Changes in peak power and Power time test over 10 seconds were analysed using a paired t-test ($P = 0.1$). **Results:** Mean differences between baseline and follow-up in peak power and power time test increased by 19.46 ± 10.42 W ($P < 0.09$) and 9.39 ± 4.66 ($P < 0.07$), respectively, from total power. Moreover, exercise data suggest that the training program gradually led to

higher peak power while total work decreased. **Conclusion:** The study concludes that the training program and pneumatic machine enhanced the power of national seated shot putters, as evidenced by increased shot put distances during the study period compared to previous achievements.

Effect of Core Stability on the Postural Sway Among Malaysian Elite Lawn Bowlers

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Objectives: In lawn bowls, athletes lunge with trunk leans forward and swing the bowl-arm while maintaining stability. This study aimed to investigate the effectiveness of core stability exercises on the postural sway of Malaysian elite lawn bowlers. **Methods:** Eighteen Malaysian national lawn bowlers underwent static and dynamic stability exercises for twelve weeks targeting lower limbs and core. Parallel and single leg stance conditions were held for 30 seconds on a force platform before and after the intervention. Statistical analysis was conducted on sway path, velocity, and area of athlete center of pressure. **Results:** The Shapiro-Wilk test indicated non-normal distribution of the data. Wilcoxon Signed rank test was used to compare pre and post data, showing significant reductions in all variables. For the parallel stance, sway path decreased from 366.7 ± 90.0 to 289.0 ± 43.5 mm ($Z = -3.593$; $P < 0.001$), velocity from 12.2 ± 3.0 to 9.6 ± 1.5 mm/s ($Z = -3.593$; $P < 0.001$), and area from 361.2 ± 171.3 to 252.0 ± 68.7 mm² ($Z = -2.940$; $P = 0.003$). Similarly, for the left and right leg, sway path, velocity, and area decreased significantly. **Conclusion:** The training program effectively improved the stability of athletes, with improvements observed in sway path, velocity, and area metrics in both parallel and single leg stances.

Effects of Acheta Domesticus Supplementation on Post-Exercise Muscle Recovery in Recreationally Active Males

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Objectives: This study aimed to assess the capability and potential of house cricket (*Acheta domesticus*) supplementation on muscle recovery following eccentric exercise. **Methods:** Thirty-six recreationally active males performed 100 drop jumps to induce delayed onset muscle soreness (DOMS). They were divided into three groups: supplemented with house cricket (CRI) or whey protein isolate (WHE) to reach a daily protein intake of 1.4 g/kg, or with isocaloric maltodextrin (CON). Isokinetic knee extension (KEX) and flexion (KFX), isometric knee extension (IKE), countermovement jump (CMJ), squat jump (SQJ), and muscle soreness (MS) measured via a 10 cm visual analogue scale were assessed at baseline, 10 minutes, 24 hours, 48 hours, and 72 hours after the drop jumps. **Results:** Immediately after exercise, participants experienced significant reductions in KEX (~13%), KFX (~5%), IKE (~22%), CMJ (~12%), SQJ (~13%), and an increase in MS (~5.4 cm) ($P < 0.05$). CRI and WHE showed better recovery of KEX compared to CON (Time x Group interaction, $P < 0.001$); WHE fully recovered by 48 hours, and CRI showed a greater recovery trend ($ES = 0.8$) than CON. KIS recovery was faster in CRI and WHE compared to CON (Time x Group interaction, $P < 0.001$). Meanwhile, KFX, CMJ, SQJ, and MS showed similar patterns of recovery in all groups (Time x Group interaction, $P > 0.05$). **Conclusion:** House cricket supplementation demonstrated promising potential for accelerating muscle function recovery over 72 hours following a single bout of exercise in recreationally active males, comparable to whey protein.

Role of Stingless Bee Honey on Blood Glucose and Inflammation Marker in Rat's Skeletal Muscle

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Objectives: Stingless bee honey is recognised for its anti-inflammatory properties, yet exercise may elevate certain inflammatory markers. This study examines the effect of stingless bee honey on blood glucose levels and inflammatory markers IL-6 and TNF-alpha in rat skeletal muscle. **Methods:** Twenty Wistar rats were divided into four groups (control, honey, exercise control, exercise with honey). Stingless bee honey was administered at 9.3 g/BW every morning, one hour before exercise. The exercise groups underwent swimming exercises in a 1 m x 1 m x 80 cm pool at 35°C for 6 days a week for a total of 28 days. Gastrocnemius muscle samples were collected for analysis of IL-6 and TNF-alpha using western blot. **Results:** There was no significant decrease in blood glucose levels in Wistar rats. However, there was a significant increase in IL-6 and TNF-alpha in the exercise control group, while the exercise with honey group showed a significant decrease in these markers. **Conclusion:** Stingless bee honey did not impact blood glucose levels but did affect the inflammation process induced by exercise, leading to reduced levels of IL-6 and TNF-alpha.

Enhancing Antioxidant Capacity in Sedentary Smokers: The impact of Moringa Oleifera supplementation and exercise

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Objectives: Cigarette smoking poses a significant risk for oxidative stress and related diseases due to reactive oxygen species generation. Moringa oleifera (MO), rich in antioxidants, has shown promise in mitigating oxidative damage. This study investigates the antioxidant capacity of MO supplementation alone and in combination with moderate-intensity exercise among smokers. **Methods:** A randomised controlled trial was conducted with 27 sedentary male smokers aged 20-45 years, divided into three groups: Group A (Control), Group B (MO supplementation, no exercise), and Group C (MO supplementation and exercise). Groups B and C took 4 capsules daily for 8 weeks, each containing 300 mg of pure MO leaf powder, totaling 1200 mg/day. Additionally, Group C underwent moderate-intensity aerobic exercise thrice weekly. Group A did not participate in the exercise program or consume MO. Antioxidant capacity was assessed using serum levels of antioxidant enzymes and markers of oxidative stress (prostaglandin F_{2α}). **Results:** Group C exhibited significant improvements in total antioxidant capacity (TOAC; 50.76 ± 20.38 U/mL) at post-test ($P < 0.05$). **Conclusion:** MO supplementation alone effectively improved antioxidant capacity among sedentary smokers. However, combining supplementation with moderate-

intensity exercise yielded synergistic effects, leading to greater improvements in antioxidant enzyme levels. These findings suggest that a combined approach of MO supplementation and exercise may be particularly beneficial for mitigating oxidative damage and reducing the risk of smoking-related diseases.

Kinematic of The Karate Punching Techniques and Reactive Strength Index Modified Profiling Among Asian Elite Karateka

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Objective: This study examines the Reactive Strength Index Modified (RSImod) as a performance indicator in combat sports, specifically karate, addressing the gap in research on RSImod's relevance to hand-dominant sports and its connection to punching speed in elite Asian karate athletes. **Methods:** Eighty-four Asian karate athletes participating in the Asian Karate Federation Championships 2023 were involved in this study. Data collection included demographic surveys, anthropometric measurements, and analysis of karate hand-attacking techniques (Kizami Tsuki [KT], Gyaku Tsuki [GT], and combinations of Kizami and Gyaku Tsuki [KG]) using force platforms and motion capture analysis. Jump height (JH), flight time (FT), peak force (PF), time to take off (TTT), and RSImod of the upper and lower body were assessed with countermovement jump (CMJ) and ballistic push-up (BPU) tests. Statistical analysis using SPSS version 25 explored the relationship between CMJ, BPU, and punching time. **Results:** Significant correlations were found between RSImod from CMJ tests and Kizami-Gyaku Tsuki combination punch speed. Additionally, a shorter time to take off in CMJ related to faster Gyaku Tsuki and combination punches. **Conclusion:** Higher RSImod values may indicate improved speed in KG, and individuals with shorter TTT values in CMJ may excel in both GT and KG, highlighting the importance of lower-body power in punching performance in karate.

Assessing the Impact of Arch-Support Insoles on Plantar Pressure in Race Walking

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Objectives: The 50-km race walk, longer than marathons by 7.8 km, subjects a 67 kg walker's feet to over 2016 tons of force, increasing risks of foot and knee injuries. This study examines if arch-support insoles can reduce plantar pressure and improve pressure distribution. **Methods:** Twenty male race walkers from Shandong participated, walking for 400 minutes at 3.5–3.8 m/s using their regular shoes with both functional and standard insoles, in random order. Speed was tracked by Smartspeed timing gates, with data collected from ten steps in the last 100 m of each walk. Plantar pressure was recorded by insoles, examining peak pressures in eight-foot sub-regions and overall ground reaction force (GRF), including medial and lateral heels, arches, metatarsophalangeal joints (MPJs) 1–5, and the hallux. A two-way ANOVA analysed pressure differences by foot region and insole type, with significance set at 0.05. **Results:** Arch-supported insoles significantly lowered peak pressures and impulses on the MPJs and heels, along with the first peak of the GRF. While the first GRF peak decreased significantly ($P = 0.034$), changes in the second peak were not statistically significant ($P = 0.078$). **Conclusion:** Arch-supported insoles effectively reduce peak pressures and impulses in critical areas of the foot during race walking, particularly in the MPJs and heels. The decreased first GRF peak suggests that these insoles help absorb shock during the heel strike phase, potentially reducing injury risks in the foot and leg.

Increasing Toe-Out Angle Reduces the Risk of Inversion Ankle Sprain When Cai Drop-Landing

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Objectives: The aim is to investigate the effects of increased foot toe-out angle on inversion ankle sprain risks when CAI drop-landing and explore the relationships of toe-out angle and representative variables. **Methods:** Thirty participants with CAI were recruited. Participants dropped down from a 30cm height platform and landed on a trap door apparatus bilaterally, with one of the two platforms tilting with 24° inversion and 15° plantarflexion. The positions of the platforms could be interchanged so the affected limb could land on the trap door platform. Participants landed in two conditions: natural landing (NL) and toe-out landing (TL). The latter had a higher foot toe-out angle of about 120 - 150% of that in the former condition. Paired-sample t-tests and Pearson correlation analysis were used to analyse the kinematic data. **Results:** Compared to the NL condition, participants showed a decreased peak ankle inversion angle (NL: $7.53 \pm 1.07^\circ$, TL: $5.56 \pm 0.98^\circ$; $P < 0.001$, Cohen's $d = 1.993$), a slower peak inversion angular velocity (NL: $23.64 \pm 2.31^\circ/s$, TL: $18.94 \pm 2.69^\circ/s$; $P = 0.053$, Cohen's $d = 0.751$), and an earlier peak inversion time (NL: 110.78 ± 8.99 ms, TL: 84.43 ± 11.63 ms; $P = 0.001$, Cohen's $d = 1.346$) in the TL condition. The foot toe-out angle during drop landing was negatively correlated with the peak ankle inversion angle ($P = 0.005$, $r = -0.374$), peak inversion angular velocity ($P = 0.006$, $r = -0.356$), and the peak inversion time ($P = 0.001$, $r = -0.451$). **Conclusion:** Increasing the toe-out angle during drop landing could reduce the peak ankle inversion angle and advance the peak inversion time, thereby reducing the risk of inversion ankle sprains among people with CAI.

A Study of Gait Joint Motion Analysis after Anterior Cruciate Ligament Rupture Based on a Wearable Inertial Sensor System

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Objectives: Wearable devices employing inertial sensors offer advantages such as multi-joint capture and portability. With a high incidence of anterior cruciate ligament (ACL) injuries and limited clinical quantitative assessment of patient function, this study aimed to conduct gait analysis using an inertial sensor system in patients with ACL rupture. **Methods:** Thirty volunteers participated, with 12 individuals in the ACL group and 18 in the control group. Kinematic data were collected using wearable sensors while subjects walked on a treadmill at 4 km/h to measure knee motion angles. Subsequently, the subjects' knees were immobilised, and data collection was

repeated. **Results:** In the ACL group, the angle of abduction and adduction was significantly greater on the healthy side (0.8 ± 1.1) compared to the affected side (0.4 ± 1.0 ; $P < 0.01$), with a side-to-side difference of -0.4° . Similarly, internal and external rotation angles were smaller on the healthy side than the affected side ($P < 0.05$), with a side-to-side difference of -1.54° . The side-to-side differences in both freedoms decreased after knee soft immobilisation. **Conclusion:** The affected side in the ACL group exhibited reduced abduction and adduction angles compared to the healthy side. Conversely, the internal and external rotation angles were larger on the affected side. Knee soft immobilisation led to a reduction in the side-to-side differences in the ACL group.

Relationship Between Isokinetic Knee Strength and Ball Release Kinematics in Cricket Fast Bowlers

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Objectives: Cricket fast bowlers aim to maximise ball speed and deliver the ball from a greater height to improve bowling efficacy. A straighter front knee at ball release contributes to greater ball speed and ball release height. To achieve this, bowlers require good dynamic strength of the front lower limb, particularly quadriceps concentric & hamstring eccentric strength. This study aims to evaluate the relationship between knee strength and ball release kinematics of the front limb. **Methods:** Forty male elite fast bowlers underwent 3D biomechanical analysis of their bowling action in an indoor lab. Knee angle at Ball release, Ball Release Height, and Maximum Ball Speed were measured. Isokinetic knee strength was tested using a Biodex System 4 Pro Isokinetic Dynamometer. Quadriceps concentric (Qconc) and Hamstring eccentric (Hecc) Peak Torques were obtained. Pearson correlation was used to study the relationship between the outcome variables with 0.05 as the level of significance. **Results:** Knee angle at Ball Release showed correlations with Qconc ($r = -0.41$, $P = 0.019$), Hecc ($r = -0.44$, $P = 0.029$), Ball Release Height ($r = -0.23$, $P = 0.015$), and ball speed ($r = -0.59$, $P = 0.007$). **Conclusion:** Bowlers with greater quadriceps concentric and hamstring eccentric strength were able to bowl with a straighter front knee at ball release and higher ball speed. Weak correlation with ball release height could be attributed to excessive trunk flexion. Plyometric training to improve Qconc and Hecc strength could optimize knee angle at ball release and thereby improve the efficiency of ball release. These findings carry strength & conditioning implications for fast bowlers.

Affection of Low-Grade PS on Return to Sport and Psychological Results in Patients After Anterior Cruciate Ligament Reconstruction

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Objectives: Residual pivot shift (PS) after anterior cruciate ligament (ACL) reconstruction has been reported to be associated with poor clinical outcomes, while its effect on return to sport (RTS) and psychological results remains undetermined. This study aims to analyze the RTS rate and psychological outcomes of patients with low-grade PS after ACLR in the short-term follow-up compared to patients with negative PS. **Methods:** A follow-up database of patients undergoing ACL reconstruction was reviewed. Based on the results of the PS test at the last follow-up, patients were divided into two groups: the low-grade PS group and the control group. Demographic data, preoperative and postoperative Tegner score, postoperative RTS rate, ACL-RSI rating scale, Lysholm score, and IKDC score were compared between the two groups. **Results:** Fifty-nine patients were included in this study, with 28 patients in the low-grade PS group and 31 patients in the control group. The average follow-up time was 3.6 (1.0–5.7) years. There were no significant differences in age, sex, BMI, Tegner scores, Lysholm score, and IKDC score between the two groups. The return-to-sport rate did not significantly differ between the two groups (35.7% and 41.9%; $P = 0.625$). However, in the comparison of ACL-RSI scores, the control group exhibited significantly better scores than the low-degree PS group ($P < 0.05$). **Conclusion:** In the short-term follow-up after ACL reconstruction, residual low-grade PS had a significant negative effect on psychological outcomes and showed a trend toward a lower but not significantly different return-to-sport rate.

The Impact of Integrating Music with Sports Games on Alleviating Stress and Anxiety Among Adolescents During COVID-19: A randomised controlled trial

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Objectives: This study aimed to investigate the impact of combining music with sports games to alleviate stress and anxiety among adolescents amid the COVID-19 pandemic. **Methods:** A prospective randomised controlled trial was conducted with 200 volunteers assigned to four groups: music-only, sports games only, music combined with sports games, and traditional moderate-intensity exercise. Participants completed the Stress and Anxiety to Viral Epidemics-6 (SAVE-6) questionnaire, and their serum cortisol levels, heart rate (HR), and blood oxygen saturation (SpO₂) were measured before and after the intervention. **Results:** Stress and anxiety levels decreased across all groups, with the music combined with sports games group exhibiting the most significant reduction ($P < 0.05$). Furthermore, serum cortisol levels decreased significantly in all intervention groups, with the most prominent decrease in the music combined with sports games group ($P < 0.05$). Decreases in HR levels were observed in both the sports games and music combined with sports games groups ($P < 0.05$). Moreover, SpO₂ levels significantly increased in the sports games and music combined with sports games groups during the intervention ($P < 0.05$), with the latter group showing notably higher SpO₂ levels compared to the other groups ($P < 0.05$). **Conclusion:** Integrating music with sports games proves to be a promising strategy in reducing stress and anxiety levels among adolescents impacted by COVID-19. This approach not only effectively mitigates stress and anxiety but also positively influences serum cortisol levels, HR, and SpO₂, offering a holistic approach to mental and physical well-being in this challenging period.

Enhancing Adolescent Mental Health: *The effect of regular exercise on alleviating depression and anxiety through neuroinflammation suppression*

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Objectives: Depression and anxiety are leading causes of adolescent disability globally. Present therapeutic approaches largely focus on pharmacological and psychological interventions, yet their efficacy and adaptability across diverse adolescent populations remain areas of ongoing investigation. This study aims to examine the impact of regular exercise on emotional recovery in chronic unpredictable stress (CUS) mice. **Methods:** Mice were subjected to CUS to simulate adolescent depression. Following 28 days of CUS, the exercise group began daily swimming training from 12 to 4 PM until day 56. Depression, anxiety, and cognitive abilities were assessed through the sugar water preference experiment, tail hanging experiment, forced swimming experiment, open field, and new object recognition experiment. Additionally, levels of inflammatory markers IL-6, IL-18, IL-13, and TNF- α in the hippocampus were measured with ELISA. **Results:** Regular exercise significantly improved anxiety, depression, and cognitive learning abilities in young mice, as evidenced by increased sugar water preference, decreased immobility in tail suspension and forced swimming tests, greater activity in the central area of open field tests, and enhanced exploration in new object recognition tests ($P < 0.05$). Furthermore, regular exercise significantly decreased the levels of proinflammatory markers IL-6, IL-18, IL-13, and TNF- α in the hippocampus when compared to control CUS mice ($P < 0.05$). **Conclusion:** These findings demonstrate that regular exercise significantly reduces anxiety, depression, and cognitive issues in mice by modulating neuroinflammation, underscoring the importance of physical activity in adolescent mental health.

Protocol for a Cross-Sectional Study to Evaluate the Use of Imagery on Cognitive Functions

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Objectives: Decline or deficiency in cognitive function can lead to various negative consequences, including difficulties in academic or occupational pursuits, social impairment, and increased risk of mental health issues. Particularly for athletes, competing in dynamic team sports requires high cognitive talents, including the capacity to process vast volumes of information quickly and make appropriate reactions in fast-paced and constantly changing surroundings. Empirical research on the relationship between imagery and cognitive functioning is still in its infancy. Therefore, the purpose of the present investigation is to analyze the connection between the utilization of imagery and cognitive function. **Methods:** A cross-sectional design will be employed on college athletes from Universiti Kebangsaan Malaysia. Data will be collected using the Imagery Use Questionnaire (IUQ) and the Stroop Test. The IUQ is a self-report questionnaire designed to assess an individual's frequency and purposes of using imagery in sports and exercise contexts. Additionally, the Stroop Test requires participants to distinguish a color-word stimulus under a conflict condition using an event-related design to measure cognitive function. Statistical analysis will be conducted using SPSS to determine the relationship between the two. **Results:** It is hypothesised that there is a significant connection between the utilisation of imagery and the functioning of the cognitive system. **Conclusion:** It is anticipated that the outcome will contribute to the existing body of literature concerning the substantial use of imagery to enhance cognitive performance.

Grey Correlation Analysis of Winning Techniques Among Elite Male Boxers in the Lightweight Category at the World Level

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Objectives: Using match results as the reference point, this study aims to thoroughly explore the impact of successfully employing various techniques on boxing match outcomes. **Methods:** Elite male boxers in the lightweight category during the 2020 Tokyo Olympics were analysed using grey correlation analysis, video observation, and mathematical statistics. The study investigated the effect of successfully executing various technical indicators (scoring techniques and defensive techniques) on the degree of victory or defeat. **Results:** In terms of scoring techniques, elite boxers excelled in executing combination punches and straight front and backhand single punches. Additionally, defensive strategies such as dodging, blocking, footwork, and head-holding techniques were among the most effectively utilised by these athletes. **Conclusion:** Grey correlation analysis offers a quantitative approach that effectively highlights individual technical characteristics of boxers, including their strengths and weaknesses. It provides a precise evaluation of the rationality and effectiveness of athletes' boxing techniques, serving as a solid foundation for developing tailored technique application plans and training programs. Furthermore, this method enables the analysis and diagnosis of opponents' technical applications, providing boxers with theoretical support in selecting appropriate technical strategies to counter diverse opponent styles. Additionally, this method holds potential for future application in the technical analysis of other combat sports.

Effects of Velocity-Based Training on Explosive Power in Professional Female Judo Athletes

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Objectives: Velocity-based training allows real-time monitoring of athlete and barbell movement speed, enabling specific speed training intervals to achieve training goals. This study aims to explore the effect of velocity-based training on the explosive power of professional female judo athletes. **Methods:** Six professional female judo athletes ($n = 6$; height: 158 ± 5 cm; weight: 57.2 ± 4.5 kg) will undergo velocity-based training with high pulls three times a week for three weeks. Training volume will be consistent, and none of the athletes have used velocity-based training methods before this intervention. Changes in body composition, vertical jump height, standing long jump, and barbell high pull peak speed indicators will be measured before and after training. **Results:** After three weeks of training, there

were no significant changes in athletes' weight, muscle mass, and body fat ($P > 0.05$). However, athletes showed significant improvements in vertical jump height and standing long jump ($P < 0.01$). Additionally, there was a significant improvement in barbell peak high pulling speed ($P < 0.01$). **Conclusion:** Three weeks of velocity-based training effectively improves the explosive power of female professional judo athletes. This improvement is demonstrated by increased speed indicators such as vertical jump height, standing long jump, and barbell high pull peak speed, contributing positively to overall explosive power enhancement.

Normative Data for Malaysian Junior and Young Swimmers

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Objectives: This study aimed to establish normative data for Malaysian junior and young swimmers participating in long-course swimming events. **Methods:** A total of 8,063 race results were collected from the 57th and 58th MILO/MAS Malaysia Invitational Age Group Swimming Championship (long-course pool events). Race results from each age group (≤ 10 , 11–12, 13–14, 15–17, and 18–25) were analysed by sex, excluding the 4 × 50 m medley relay. The results were converted to FINA swim points and reclassified into sex-age categories. Normative data was established using a regression-based approach in Microsoft Office Excel 2019, calculating adjusted mean and standard deviation (SD) to develop five tiers of norms (Excellent, Good, Average, Below Average, Poor) for each sex-age category. **Results:** The normative data is presented based on sex and age groups. In male swimmers, the swimming performance for age groups 10 years and below, 11–12 years, 13–14 years, 15–17 years, and 18–25 years was 230.55 ± 56.33 , 323.50 ± 85.83 , 416.44 ± 94.34 , 509.38 ± 88.58 , and 602.33 ± 101.03 , respectively. For female swimmers, the corresponding swimming performance was 291.38 ± 86.12 , 358.89 ± 94.52 , 426.41 ± 89.49 , 493.92 ± 101.19 , and 561.44 ± 77.09 , respectively. **Conclusion:** Swimming performance in junior-age categories tends to increase with age. The established normative data is applicable to regional competitive swimmers, particularly in Thailand, as well as swimmers at the national championship level. It provides valuable insights into the impact of growth on swimming performance and aids in training specification.

Capturing Human Movement in Sports: A comparison of lab-based and on-field motion capture systems during badminton lunge

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Objectives: While optical motion capture (OMC) systems are considered the gold standard for tracking human movement, their fixed equipment and elaborate setup time limit their applicability in field settings. This study aims to compare custom inertial measurement unit (IMU) and camera-based markerless motion capture (MMC) modalities with OMC in measuring ankle plantar-dorsiflexion during a badminton lunge. **Methods:** A single male subject (25 years) performed a forward badminton lunge while wearing shoes. Inertial sensors were attached to the tibia and foot following the Istituti Ortopedici Rizzoli protocol, capturing shank and foot kinematics. An eight-camera OMC system (Qualisys) and a synced video camera (Kinovea) recorded marker-based data. Ankle plantar-dorsiflexion angles during foot landing (dorsiflexion) and withdrawal (plantarflexion) were measured. The mean absolute error (MAE) for IMU and MMC compared to OMC was computed. **Results:** The MAE for IMU compared to OMC was 3.28° and 5.45° , while that of MMC compared to OMC was 2.14° and 5.44° during the foot landing and foot withdrawal phases, respectively. The larger error during foot withdrawal could be attributed to larger maximum plantarflexion angles (30°), compared to smaller maximum dorsiflexion angles (12°) during foot landing. Foot landing and foot withdrawal phases were selected as critical high-impact phases during the entire lunge to compare on-field modalities to the gold standard OMC. **Conclusion:** The positive outcomes demonstrated in this study support the use of on-field motion capture systems. However, further investigation is imperative to determine their accuracy and reliability for complex movements compared to lab-based systems.

Unveiling the Secrets of Endurance Training: New insights into the potential mechanisms and regulation of myosin and energy metabolism

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Objectives: Endurance training offers numerous health benefits, yet understanding its mechanisms remains a challenge. This study aims to provide fundamental insights into the potential mechanisms underlying endurance training. **Methods:** GSE242354 data were retrieved from the GEO database, and differentially expressed genes (DEGs) were identified from high-throughput sequencing data of whole blood samples. R language was employed for DEG analysis, Gene Ontology (GO) and Kyoto Encyclopedia of Genes and Genomes (KEGG) function enrichment analysis, protein-protein interaction (PPI) network construction, and identification of important subnetworks and key genes. Twenty gastrocnemius muscle samples were also analysed to explore myosin regulation and energy metabolism pathways. **Results:** A total of 1,325 DEGs were identified, comprising 200 up-regulated genes and 1,125 down-regulated genes. GO and KEGG pathway analyses revealed that DEGs primarily targeted the organic acid catabolic process. A PPI network was constructed, revealing three important subnetworks and 14 key differential genes, including GRWD1. Enrichment analysis determined their crucial involvement in processes such as RNA binding and preribosome assembly. Analysis of gastrocnemius muscle samples showed increased expression of MYH7B and MYH10, encoding actin heavy chain, and MYL4, encoding light chain, indicating induction of a slow muscle fibre phenotype by endurance training. Moreover, FBP2, ALDOC, and ENO1 were found to regulate glycolytic metabolic pathways, promoting energy-saving during exercise. **Conclusion:** This study identified potential mechanisms underlying endurance training, revealing adaptations in energy metabolism towards efficiency following long-term endurance training.

Hair Testing Reveals Doping Histories in Sports: An *in vivo-in silico-clinical* investigation

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Objectives: Sports doping is regulated by WADA's prohibited list, with samples regularly screened for prohibited substances. While blood and urine offer short-term insights, hair provides long-term detection, though knowledge about detectable substances is limited. **Methods:** Due to practical challenges in human drug administration, an animal model was employed with 40 rats receiving 17 model drugs to compare dose dependencies and detection windows across different matrices. Hair incorporation data from the animal experiment were extrapolated to all substances on the List through *in-silico* prediction. Validation was conducted in a proof-of-concept human study involving 8 participants consuming diuretics. Hair samples underwent decontamination, homogenization, extraction, and analysis using ultra-performance liquid chromatography tandem mass spectrometry. **Results:** Plasma exhibited optimal dose dependencies with limited detection windows, while urine, faeces, and hair showed a reasonable relationship with the administered dose. Notably, hair displayed the highest detection probability (14 out of 17) for compounds, including anabolic agents, hormones, and diuretics, with beta-2 agonists undetected. Diuretics such as furosemide, canrenone, and hydrochlorothiazide showed the highest hair incorporation. Human hair confirmed diuretic detectability, and their use duration was determined via segmental analysis. Noteworthy is the first-time reporting of canrenone in human hair. **Conclusion:** Identifying detectable compounds in hair makes it a valuable addition to doping control, especially in result management. Segmented hair testing estimates the timeframe of substance use, distinguishing deliberate abuse from inadvertent exposure.

Association between Visual Analogue Scale and Functional Assessments in Patients with Non-Specific Chronic Low Back Pain

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Objectives: Non-specific chronic low back pain (NSCLBP) patients typically exhibit functional impairment due to pain, such as slow walking speed, limited trunk flexibility, and weak trunk extension strength. However, the correlation between the level of pain and functional impairment remains unclear. Therefore, this study aimed to explore the association between pain and functional assessments in NSCLBP patients. **Methods:** Sixty NSCLBP patients (mean age 34.83 ± 8.61, weight 75.77 ± 13.68 kg, height 170.81 ± 6.52 cm, BMI 25.94 ± 4.31 kg/m²) were recruited from the outpatient department of the National Sports Institute of Malaysia. The Visual analogue scale (VAS) was used to measure the average pain score. Subsequently, all patients completed three trials of the 3-meter time up and go (TUG), sit and reach (SAR), trunk lateral flexion, trunk rotation, lumbar flexion, lumbar extension, straight leg raise (SLR), and trunk extension strength sequence on the same day. Pearson correlation was performed to examine the relationship between the VAS and the functional parameters. **Results:** There was a significant relationship between the VAS and lumbar flexion ($r = -0.353$; $P < 0.05$), right SLR ($r = -0.335$; $P < 0.05$), and left SLR ($r = -0.338$; $P < 0.05$). However, there was no significant relationship between pain and the other parameters ($P > 0.05$). **Conclusion:** In NSCLBP patients, the pain intensity is inversely related to lumbar flexion and straight leg raise. Therefore, functional impairment, especially in lumbar and lower limb flexibility in the sagittal plane, is more restricted with increasing pain in patients with NSCLBP.

Long-term Outcomes of Subacromial Spacer Insertion for the Treatment of Irreparable Massive Rotator Cuff Tears

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Objectives: Long-term outcomes of biodegradable subacromial spacer (SAS) to treat irreparable massive rotator cuff tears (IMRCT) were rarely reported. This study aims to evaluate the long-term outcomes of SAS. **Methods:** Prospective data from 15 IMRCT patients treated with SAS were collected. Patients with ≥5 years of follow-up were analysed for long-term outcomes. Preoperative, 2-year post-surgery (short-term), and ≥5-year post-surgery (long-term) assessments included abduction power, visual analogue scales for pain (pVAS), active range of motion (ROM), and American Shoulder and Elbow Surgeons score (ASES). **Results:** The mean follow-up period was 76.5 ± 5.3 months (range: 71–83). Abduction power (preoperative vs. short-term vs. long-term 4.2 ± 0.6 versus 4.1 ± 0.7 versus 4.2 ± 0.8) was not significantly different between the compared time points ($P = 0.575$). However, pVAS (6.4 ± 2.0 versus 0.9 ± 1.6 versus 1.1 ± 1.7), active external rotation (38.2 ± 24.9° versus 60.0 ± 21.5° versus 54.3 ± 27.4°), and ASES (46.1 ± 13.6 versus 85.4 ± 14.2 versus 93.4 ± 11.4) improved after surgery in both short-term and long-term outcomes ($P < 0.05$), and all long-term outcomes did not deteriorate from short-term follow-up ($P > 0.05$). Furthermore, active forward flexion at the last follow-up (160.4 ± 18.9°) was improved not only compared to the preoperative workup (128.9 ± 41.5°; $P < 0.001$) but also the short-term follow-up (150.0 ± 20.3°; $P = 0.006$). **Conclusion:** The long-term outcomes of SAS were favourable and did not deteriorate over time. Therefore, SAS might be a viable option for the treatment of IMRCT.

Intermittent Pneumatic Compression and Recovery of Muscle Function and Perceived Soreness: Does more equal better?

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Objectives: Intermittent pneumatic compression (IPC) has gained popularity among athletes as a recovery tool, yet data on its effectiveness remains scarce, and the optimal dosage has not been determined. This study aimed to investigate the impact of different IPC durations on muscle function recovery and perceived soreness in well-trained team sports athletes. **Methods:** A total of 29 well-trained team sports athletes participated in a 75-minute simulated game circuit, involving four sets of 15-minute high-intensity intermittent movements with 5-minute rest intervals. Participants were then randomly assigned to one of three groups: (i) a 45-minute session of IPC (IPC45); (ii) two 45-minute sessions of IPC separated by 4–6 hours (IPC90); and (iii) passive rest (CTRL) after the

simulated game circuit (approximately 2 hours). These interventions were repeated at the same time of day at 24 and 48 hours post-exercise. Peak propulsive force (PPF) and visual analogue scale (VAS) scores were measured before (PRE), immediately after (POST), and at 24, 48, and 72 hours after the simulated game circuit to assess muscle function recovery and perceived soreness. **Results:** Perceived soreness increased significantly in all three groups immediately after, at 24 hours, and at 48 hours post-exercise. By 72 hours, soreness returned to baseline in both IPC45 and IPC90 groups, while in the CTRL group, it remained significantly higher than baseline. PPF decreased significantly immediately after exercise but recovered to baseline at 24 hours in the IPC90 group. In contrast, PPF decreased significantly at POST, 24 hours, and 48 hours in both CTRL and IPC45 groups and only recovered to baseline at 72 hours. **Conclusion:** IPC effectively restored both muscle function and perceived soreness after high-intensity intermittent fatiguing activities. Notably, increasing the IPC dosage to 90 minutes per day significantly accelerated the restoration of peak propulsive force.

Relationship Between Ankle Mobility and Plantar Pressure in Indian Basketball Players

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Objectives: Ankle mobility plays a pivotal role in dynamic sports activities such as basketball shooting. Abnormal plantar pressure patterns, along with musculoskeletal factors like restricted ankle mobility, contribute to kinetic chain deficiencies, known risk factors for injury. This study aims to elucidate the relationship between ankle mobility and plantar pressure distribution during common basketball shooting tasks. **Methods:** Ten league-level basketball players performed shooting tasks from three distances: no-charge zone arc, free-throw line, and 3-point line. Three trials were shot from each position, during which plantar pressure was assessed using a proprietary in-shoe pressure sensor system. Ankle mobility was quantified using the DF lunge test and clinical range of motion measurement of dorsiflexion, plantar flexion, inversion, and eversion. The entire shooting trial was observed, and peak pressure was recorded. Pearson correlation was used to determine the relationship between DF ankle mobility and plantar pressure patterns, with significance set at the 0.05 level. **Results:** A significant negative correlation was observed between peak plantar pressure and ankle mobility at the free-throw line ($r = -0.1$; $P = 0.015$) and three-point line ($r = -0.2$; $P = 0.015$). Pressure was concentrated more in the forefoot. Players with increased dorsiflexion range of motion demonstrated a more uniform plantar pressure distribution, particularly evident during shooting from longer distances. **Conclusion:** This study demonstrates the influence of ankle mobility on peak plantar pressure and pressure distribution during basketball shooting. Greater ankle mobility was associated with lesser peak plantar pressures and a more balanced plantar pressure distribution, potentially enhancing performance and reducing injury risk with implications for future training.

Examining Cardiorespiratory Fitness Among Sports Medicine and Orthopaedic Doctors: Insights from a Malaysian Hospital

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Objectives: Cardiorespiratory fitness (CRF) is a critical indicator of overall health, with lower levels linked to increased risk of cardiovascular diseases, mortality, and susceptibility to various illnesses. Conversely, improving CRF reduces mortality rates. Healthcare workers, particularly doctors, face significant burnout and distress, exacerbating their health risks. This study aims to evaluate the cardiopulmonary fitness of sports medicine and orthopaedic medical practitioners in a Malaysian government hospital through cardiopulmonary exercise testing (CPET). **Methods:** Twelve medical doctors (mean age: 31.2) with an average BMI of 25.52 kg/m² underwent initial screening involving upright cycle ergometer assessment to gauge physiological components, while self-reported physical activity levels were measured using the International Physical Activity Questionnaire (IPAQ). **Results:** Assessment unveiled a range of fitness levels among the participants, with a mean VO_2 max of 32.37 ± 8.37 mL/kg/min, an anaerobic threshold (AT) of 16.43 ± 4.99 mL/kg/min, oxygen pulse of 13.40 ± 4.12 mL/beat, and VE/VCO_2 of 28.75 ± 4.39 . According to the ACSM 2019 guideline for aerobic fitness, participants were categorised as very poor (58.33%) or poor (33.33%), with only one deemed fairly fit. Conversely, IPAQ scores revealed minimal physical activity among doctors (mean = 3,759.23). We hypothesise that the demanding clinical duties of medical doctors might hinder regular physical activity, potentially accounting for the observed suboptimal fitness levels. Additionally, our assessment also identified potential hypertensive disease in a participant exhibiting exaggerated exercise-induced blood pressure elevation and two others with anaemia. **Conclusion:** This study highlights the need to address barriers for medical doctors in physical activity and implement strategies to improve their fitness, performance, and well-being.

Medical Treatment During Asian Para Games 2023 Hangzhou: A report from Indonesia National Medical Team

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Objectives: The medical team in major multi-sport events such as the Asian Para Games (APG) plays an essential role in providing optimal treatment, particularly for para-athletes. Elite para-athletes competing at the highest level are more susceptible to injury due to their conditions and biomechanics. Additionally, coaches and officials are also at risk of exhaustion. This report aims to describe the pattern of medical treatment in the Indonesia National Team during APG 2023 Hangzhou for further insight and reference. **Methods:** Data were collected during APG 2023 Hangzhou from 16th to 29th October 2023 from all delegates of the Indonesia National Team who received medical treatments. **Results:** The medical team provided 78 medical treatments, comprising two physiatrists, two physiotherapists, and four masseurs. Most of the delegates receiving medical treatments were athletes (75.6%), followed by coaches and officials (20.6%). The majority of medications or treatments given were analgesics (20.5%), kinesiotaping applications (19.2%), icing, and manual treatment (18%). Treatments were mostly performed on the field and were primarily due to pain and/or injury in the lower extremities (20.5%), back region (10.3%), as well as common cold cases (9%). Four delegates were referred to the polyclinic, two of whom were then referred to the hospital due to knee injury and unexpectedly, atrial fibrillation. **Conclusion:** Pain and sports injuries on the field remain the primary reasons for medical treatments during APG 2023 Hangzhou. However, there were also cases such as common cold and atrial fibrillation. Therefore, extensive preparation for major multi-sport events is undoubtedly crucial for the medical team.

How Swimming Strokes and Age Affect Swimming Performance: A cross-sectional study

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Objectives: Swimming performance, often measured by finished swim time, is influenced by various factors. This study aimed to determine the significance of age category and sex within swimming strokes and their differences. **Methods:** A total of 320 race results, comprising the top 8 race times of 100 m events for 4 competitive strokes across 5 age groups and sexes from the 2022 and 2023 Malaysian swimming championships, were extracted. The race time results were converted into swimming points for comparison. Means were computed using a spreadsheet program (Microsoft Office Excel 2019), and two-way mixed model ANOVA (GraphPad Prism 9.5.1) was performed to identify multiple comparisons between groups. The significance level was set at $P < 0.05$. **Results:** For all strokes, females outperformed males before 13 years of age. An intersection of swimming performance was observed in the age groups of 13–14 and 15–17. Males surpassed females in swimming performance at 18 years old and above; however, females showed a plateau for butterfly stroke and decreased performance for freestyle, backstroke, and breaststroke. Swimming performance differed significantly in the age groups of 10 and under, 11–12, and 18–25 for all swimming strokes between males and females ($P < 0.001$). **Conclusion:** In conclusion, swimming performance of males and females increases to varying degrees across age groups due to the puberty growth factor. Strength training should be implemented at different phases of puberty and in the age group of sprint event swimmers.

Development of an Online Application System of Injury and Illness Surveillance for Indonesian Football Club: A design thinking approach

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Objectives: Football, the most popular contact sport globally, reports a high injury rate. Linking surveillance to prevention programs is crucial for effectively using data to prevent and control injury and illness. Non-standardised recording methods, complicated forms, data loss, and neglect in recording processes hinder the preparation of good data reports for management and coaching staff. This study aims to develop an online system-based injury and illness surveillance application for Indonesian Football Clubs. **Methods:** Design thinking, a user-centric problem-solving approach involving five key stages (Empathise, Define, Ideate, Prototype, Test), was used to develop surveillance tailored to the specific needs of Indonesian football clubs. **Results:** Mockup design development used an open-source platform for prototyping models. Initial trials generated a data report using injury and illness data from Indonesian Football Clubs (Club P) in 2022. Overall, 48 total cases were reported through this surveillance. This software facilitates registration and analysis of sports-related injuries and illnesses among players by the medical team. The application delivers a data report featuring demographic data tables, football club player charts, and details on injury and illness cases. It includes reminders via notifications to inform the medical team about the need to check the latest condition and treatment of injuries or illnesses. **Conclusion:** An online application proved feasible for ensuring data safety, good adherence, and a standard recording method. Further testing is required for real-time use across various football clubs.

Analyzing Defensive Approaches of Positioning, Traps, and Shot Variability During Penalty Corner in FIH Odisha Hockey Men's World Cup 2023: A descriptive data analysis

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Objectives: The penalty corner has become a pivotal tactic in field hockey, granting the attacking team an advantage through strategic variations despite defender limitations. Penalty corner defence in field hockey involves strategic manoeuvres to prevent the opposing team from scoring during a set-piece corner situation, typically requiring quick decision-making and coordinated defensive efforts. This study aimed to examine defensive strategies in the 2023 FIH Odisha Hockey Men's World Cup, focusing on positioning, traps, and shot variability. **Methods:** Data were collected through the analysis of 445 footages across 16 countries. A camcorder (60 fps, 2,560 × 1,440) captured footage from behind the goalpost. Hudl Sportscode ELITE (v12.28.0) was used to analyse four defensive structures (3-1/3-1, 3-1/2-2, 2-2/2-2, 2-2/3-1) involving the goalkeeper (GK), first runner (FR), second runner (SR), right trail (RT), and postman (PM). Mean and standard deviation were calculated to assess efficiency. **Results:** After excluding 47 videos, 398 were analysed. The mean for all structures was 99.5 ± 169.08 . Structure 1 (3-1/3-1) had a mean of 44.13 ± 60.26 (88.7%, 358 videos). Structure 2 (3-1/2-2) had a mean of 2.50 ± 3.66 (5.0%, 20 videos). Structure 3 (2-2/2-2) had a mean of 1.00 ± 1.31 (2.0%, 8 videos). Meanwhile, Structure 4 (2-2/3-1) showed a mean of 2.13 ± 4.09 (4.3%, 17 videos). **Conclusion:** Structure 1 (3-1/3-1) was the dominant configuration, suggesting its central role in penalty corner defence. Conversely, Structures 2, 3, and 4 exhibit lower means and contribute to a smaller proportion of the total footage, indicating their relatively lesser prevalence or significance in the dataset.

The Effect of Exercise and Music Interventions on Insomnia in Adults: A systematic review

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Objectives: Insomnia stands out as the most prevalent sleep disorder, posing significant challenges for individuals and society at large. Non-pharmacological treatments such as exercise and music have been suggested as safe, cost-effective, and accessible solutions. This systematic review aims to gather evidence on the efficacy of exercise and music in ameliorating insomnia among adults. **Methods:** A literature search was conducted on PubMed, ScienceDirect, SPORTDiscus, and Web of Science using search terms related to sleep disorders, exercise, and music. The studies were eligible if they met the predefined inclusion criteria: (a) interventional studies; (b) conducted in adults (>18 years old); (c) only English-language citations from 2004 to 2024 were considered; and (d) including music and

exercise. Five articles were included. **Results:** The review unveiled limited evidence on the beneficial impact of exercise and music in alleviating insomnia. Outcome assessment tools utilised across studies included the Jenkins Sleep Scale (JSS), Pittsburgh Sleep Quality Index, and portable sleep-EEG devices. Notably, out of five intervention studies, other than one that focused on breast cancer patients, the rest exhibited notable enhancements in sleep-related outcomes. **Conclusion:** The findings suggest that intervention programmes incorporating diverse combinations of exercise and music exhibit limited effects on enhancing sleep quality. These interventions varied, with some involving music during exercise and others employing separate exercise and music sessions. In cases where intervention efficacy was hindered by conditions like cancer, further investigations are warranted for future research endeavours.

The Effects of Ethanolic Nutmeg Extract (*Myristica fragrans*) in Acute Phase Inflammatory Response of Skeletal Muscle Injury

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Objectives: Muscle bruising remains a significant concern in sports injuries, particularly in contact sports. Empirically, an alternative approach was taken with the utilization of herbs for recovering muscle contusion. Interestingly, nutmeg, an herb from Maluku, Indonesia, has been previously used for muscle injury problems, but the specific mechanisms and benefits are still unclear. In vivo exploration, we observed the potential effect of nutmeg in the acute phase inflammatory response of muscle injury. **Methods:** Fifteen Wistar male rats aged 8 weeks (BW: 175-220 g) were randomly divided into three treatment groups (control, contusion, and nutmeg). The control and contusion groups were only daily given PGA 2%. Nutmeg extract (NE 250 mg/kgBW) was daily given to the nutmeg group orally for 3 days. The contusion and nutmeg groups were subjected to blunt trauma using a cylindrical iron weighing 250 g, dropped from a height of 30 cm to create a contusion model. Gait analysis was performed pre- and post-treatment. Rats were euthanised after treatment completion, and serum and gastrocnemius muscle samples were collected. Sandwich Enzyme-linked Immunosorbent Assay (ELISA) was used to measure the serum CK-MM level of rats. Immunoblotting was performed using a rat monoclonal antibody against IL-1 β and IL-6 for isolated gastrocnemius muscle samples. **Results:** The nutmeg group showed improved gait function compared to the bruise group. **Conclusion:** Nutmeg extract improves the clinical functions of muscle contusion in the acute phase inflammatory response of muscle injury.

Symptomatic Relief of Meniscal Tears and Injuries in an Athlete Following Prolotherapy: A case report

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Objectives: Tears and injuries of the meniscus result in debilitating pain that interferes with a person's mobility and daily activities. For athletes, such a diagnosis hampers performance or shatters any hopes of competing in the first place. This case report presents a case of a 19-year-old Malaysian female martial art athlete who presented with right knee pain following a series of intensive training. Magnetic Resonance Imaging revealed a medial meniscus injury and a lateral meniscus tear of the right knee. **Methods:** Prolotherapy treatment involves injecting irritants to trigger inflammation and the subsequent healing process to bring about relief. A mix of 2.5 mL of dextrose 25% and 2.5 mL of lignocaine was injected into the right knee under aseptic technique. Post-injection, the patient was instructed to rest from training and any weightbearing activities that would exacerbate symptoms. Only Tramadol was prescribed as rescue analgesia while non-steroidal anti-inflammatory drugs were off-limits. The patient was reviewed again 2 weeks post-injection to assess improvement in symptoms as well as for signs and symptoms of septic arthritis. **Results:** The patient reported the absence of pain altogether during her post-injection review. She was able to perform manoeuvres and positions that were previously painful for her. No repeated injections were given. She was able to rejoin high-intensity contact training and participated in the National Games 1 month later. **Conclusion:** Prolotherapy is a safe and affordable regenerative treatment to promote tissue healing and pain relief in musculoskeletal conditions.

Outcome of Patellar Tendinopathy Treatment Using Ultrasound-Guided Galvanic Electrolysis Technique Combined with an Eccentric Exercise Regimen: *Clinical findings*

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Objectives: The aim of this research is to demonstrate the impact of combining ultrasound-guided galvanic electrolysis technique (USGET) with an eccentric exercise programme using isoinertial resistance machines in the management of patellar tendinopathy. **Methods:** This prospective study involved 51 athlete-patients, aged between 17 and 60 (average age 35.6 years), consecutively treated since 2019 for patellar insertional tendinopathy using USGET and monitored for a duration of 2.5 years. The diagnosis for all patients relied on clinical assessment in conjunction with a colour Doppler ultrasound examination conducted using a linear probe with a frequency range of 6–15 MHz. Functional assessments were conducted at the initial visit, three months, and 2.5 years, utilising several scales such as IKDC, Kujala, Tegner, Visual Analogue Pain Scale (VAS), Satisfaction Rate, and VISA-P questionnaire. Statistical analysis was performed with SPSS version 18 with statistical significance set at 0.05. Fisher's exact test and Chi-square test were also included. ANOVA study was used to analyse the different variables. **Results:** A notable average improvement was achieved across all scales. The average treatment duration was 6 weeks. By the end of the treatment, more than 80% of the patients had successfully returned to their pre-injury level of physical activity, which increased to 100% at the 2.5-year mark. **Conclusion:** The combination of USGET with an eccentric-based rehabilitation programme using isoinertial resistance machines yields excellent clinical and functional improvements in patellar tendon health within a long-term period and with minimal morbidity.

Mind Matters: The psychological wellbeing of Malaysian athletes during injury rehabilitation process

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Objectives: Psychology is important in injury rehabilitation, however, there is a limited number of studies on monitoring the psychological status of injured athletes across the recovery process. As there is no existing study in the Malaysian high-performance sport setting, the current objective was to examine the psychological status of injured athletes throughout the rehabilitation process and gain a deeper understanding of their personalised psychological experiences during rehabilitation. **Methods:** A mixed methods research design was implemented with a sample of 40 athletes (20 male and 20 female) who suffered traumatic and severe injuries while training and/or during competitive events that prevented them from engaging in sports for a minimum of 6 weeks. They participated in a longitudinal design that collected psychometric measures of the Psychological Wellbeing Evaluation (PWE), which consisted of the Malaysian Mood Scale, Malaysian Emotion Regulation Questionnaire, and Malaysian Perceived Stress Scale, across multiple time points during the injury rehabilitation process. A semi-structured interview was also conducted with 10 athletes to identify the lived experience throughout their rehabilitation journey. **Results:** Significant fluctuations in psychological states across different rehabilitation phases were observed, as athletes in the 'return to training' phase were associated with poorer PWE scores (i.e., higher perceived stress and negative mood states, lower cognitive reappraisal). Five themes on psychological reaction, psychological qualities, psychological challenges experienced, psychological coping strategies, and psychological influential factors were derived based on qualitative thematic analysis. **Conclusion:** Findings supported the importance of regular monitoring and application of psychology in successful rehabilitation through proactive integration and cooperation among multidisciplinary professionals.

Immunomodulatory Effects of Tabata Exercise and Bee Propolis Supplementation on Cytokines in Physically Inactive Overweight Men

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Objectives: Cytokines such as interleukin (IL)-10 and IL-6 are crucial in controlling the pathological component of low-grade inflammation in overweight to obese individuals. This study aimed to analyse the IL-6 and IL-10 plasma levels response in physically inactive overweight men following Tabata exercise and bee propolis supplementation. **Methods:** Sixty physically inactive overweight men (aged 19-40 years) were recruited and randomly assigned into four groups (n = 15): control (C), bee propolis (B), exercise (E) and exercise bee propolis (EB). B and EB groups consumed bee propolis at a dosage of 1,000 mg (2 tablets of 500 mg) daily after breakfast and dinner for 12 weeks. The Tabata exercise sessions were performed by E and EB groups, 3 sessions/week, for 12 weeks. The Tabata protocol was based on the work-to-rest ratio of 20/10 secs of 85% maximum heart rate. Fasting blood samples were obtained from the antecubital vein at pre-intervention (week-1), mid-intervention (week-6) and post-intervention (week-12). The IL-6 and IL-10 serum levels were determined with commercially available ELISA kits. The data were analysed by Mixed ANOVA. **Results:** There were no significant changes in IL-6 and IL-10 in C and B groups. The mean level of serum IL-6 ($P < 0.05$) significantly decreased in EB ($P < 0.05$) and E group ($P < 0.05$) at post-test. The level of serum IL-10 was also significantly increased in the EB group ($P < 0.05$) at post-test. **Conclusion:** Regular Tabata exercise with bee propolis supplementation positively impacts the cytokine levels. This combination may contribute to improved immune responses in physically inactive overweight men.

Diurnal Dynamics of Salivary Testosterone and Cortisol Levels in Elite Athletes

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Objectives: This study explored the diurnal patterns of salivary cortisol and testosterone, which are crucial hormones in athletes' physiological responses to training and stress. The primary objective was to examine the intra-individual variation in salivary cortisol and testosterone levels among elite athletes, specifically exploring responses during morning and evening collection times. A secondary aim was to elucidate potential gender-related differences between testosterone and cortisol. **Methods:** Sixty-one Malaysian elite athletes participated in the study (36 males and 25 females; average age: 21.56 ± 3.14 years). They trained for an average of 24.49 ± 2.47 hours per week. Saliva samples were collected on non-training days using the passive drool method during morning and evening sessions to determine salivary hormone concentrations using Enzyme-Linked Immunosorbent Assay (ELISA) kits. **Results:** Preliminary findings indicated significant diurnal variations in elite athletes' salivary cortisol and testosterone levels. Cortisol levels were higher in the morning and decreased by the evening. Testosterone followed a similar pattern. Gender-specific analyses unveiled significant disparities, with males consistently exhibiting higher testosterone levels than females, emphasising distinctive hormonal responses between male and female elite athletes throughout the day. No significant gender-related differences were observed for cortisol levels. **Conclusion:** The findings underscore the need for customised training plans, considering individual hormone profiles for peak athletic performance and well-being. Recognising gender-specific responses is vital for effective interventions with elite athletes. Furthermore, emphasising standardised saliva collection times is crucial to ensuring reliable and accurate hormonal measurements.

Mastering Reaction Time: Investigation of the effects of self-talk and muscle relaxation techniques in volleyball performance

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Objectives: Despite the individual stress-reducing benefits of ST and PMR, their relative impact on reaction time remains insufficiently studied. This investigation provides valuable insights into their effectiveness in enhancing athletic performance. The findings benefit coaches and athletes seeking to improve reaction time through psychological methods. **Methods:** Twenty-four experienced male

university volleyball players (aged 18–24) with a minimum of 5 years of training were randomly assigned into control (CG; n = 8), Progressive Muscle Relaxation (PMR; n = 8), and Self-talk (n = 8) groups. Over 6 weeks, the experimental groups received either Self-talk or 15-minute PMR sessions, while the control group received no intervention. Reaction time was assessed using the SMARTfit Inc (Tract the Target system), with statistical analyses consisting of one-way ANOVA and paired t-tests ($P < 0.05$). **Results:** There was a significant improvement in reaction time in both the PMR group ($P = 0.02$) and ST group ($P < 0.01$), with ST showing the most improvement of 13% (Pre: 0.43 ± 0.05) to (Post: 0.38 ± 0.03) compared to PMR with 7.1% improvement (Pre: 0.44 ± 0.006) to (Post: 0.40 ± 0.4) and control only 1.7% improvement. There was a significant difference between groups in the post-test, determined by One-way ANOVA, ($F [2,21] = 3.90$; $P = 0.36$). Tukey post hoc revealed that differences were between CG and ST ($P = 0.029$). **Conclusion:** Despite both methods being beneficial, Self-talk training emerges as the more effective strategy to improve reaction time, promising enhanced cognitive abilities and reduced anxiety interruptions in volleyball players. This aligns with Self-talk's role in managing sport-related anxiety, which can hinder performance.

Relative Energy Deficiency in Sport in Indian National Level Rowers

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Objectives: Low energy availability (LEA) can lead to detrimental health outcomes and impaired sporting performance, particularly in endurance sports. This has been termed as Relative Energy Deficiency in Sport (RED-S), with studies showing a prevalence of 52.8% among international-level endurance athletes. There is a lack of literature regarding the prevalence of RED-S among Indian endurance athletes. The aim of this study was to identify the prevalence of RED-S in Indian national-level rowers and determine the common symptoms experienced. **Methods:** Twenty national-level rowers were screened for RED-S using validated questionnaires (LEAF-Q and LEAM-Q). The questionnaires were administered by a sports medicine physician at a private sports science facility and covered key diagnostic criteria for RED-S, including gastrointestinal and menstrual symptoms, as well as libido. Descriptive statistical analysis was performed to identify the prevalence of RED-S and symptoms of LEA. **Results:** Seven athletes (four females and three males) out of 20 were found to have RED-S. Among female athletes with RED-S, gastrointestinal and menstrual symptoms were the most common. Among male athletes, decreased libido was the most common symptom. **Conclusion:** RED-S was found to be a common yet underdiagnosed entity in this pilot study. It can lead to reduced immunity, abnormal menstrual cycles, hormonal disruptions, and cardiovascular symptoms, negatively affecting the athlete's performance. Educating trainers and athletes to administer standardised questionnaires at frequent intervals can help identify at-risk athletes and refer them to the sports medicine team for timely intervention. Further research with larger sample sizes and longer follow-up periods could yield critical knowledge in this regard.

Effect of Home Exercise Programs in Patients with Adolescent Idiopathic Scoliosis: A systematic review and meta-analysis

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Objectives: A home exercise program (HEP) shows promise for adolescent idiopathic scoliosis (AIS). According to SOSORT guidelines, physiotherapeutic-specific exercises are recommended for most individuals with mild to moderate AIS. However, neither a systematic review nor a meta-analysis has been published regarding the effectiveness of HEP for the management of AIS. This study aims to evaluate the effectiveness of HEP for AIS. **Methods:** Following the PRISMA statement, PubMed, Web of Science, The Cochrane Library, Embase, Medline, and Scopus were searched for English RCTs published before September 15, 2023. There were no interventions or non-specific physical activities in the control group. Methodological quality was assessed using the Jadad scale and Cochrane bias risk assessment tool. The primary outcomes were Cobb angle and SRS-20/SRS-22/SRS-23 total score. Two researchers independently searched publications, extracted data, and assessed the quality of the included studies. **Results:** A total of 8 studies were included and 371 patients were reported in those studies. All 8 studies reached high methodological quality, and low heterogeneity of primary outcomes was observed among the included studies. In general, compared with the control group, HEP was shown to significantly improve Cobb angle (SMD = -0.38 , 95%CI [-0.66 , -0.09]; $P = 0.009$) and SRS-20/SRS-22/SRS-23 Questionnaire Total Score (SMD = 0.41 , 95% CI [0.11 , 0.72]; $P = 0.008$). **Conclusion:** The results of this meta-analysis suggest that HEP positively impacts spinal structure and the quality of life of AIS patients. Therefore, HEP represents a feasible option for AIS patients.

A Systematic Review of Physical Activity Questionnaires Among University Students in Intervention Studies

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Objectives: Reliable and valid physical activity (PA) questionnaires are essential for assessing the impact of interventions on university students' PA behaviours. However, the PA questionnaires adopted in existing studies and their reliability and validity remain unclear. This review aims to evaluate the PA questionnaires used in interventions targeting university students and to conduct a quality assessment of their measurement properties. **Methods:** Studies on PA interventions conducted among university students that have been published were identified by searching five electronic databases. Two authors independently carried out the literature screening and data extraction. The extracted data on PA questionnaires and their measurement properties were then analysed. **Results:** Thirty-eight studies met the eligibility criteria. The included studies employed nine previously established questionnaires, with three opting for self-designed questionnaires that were not previously named. The International Physical Activity Questionnaire (IPAQ) is the most frequently used instrument, with the Godin Leisure-Time Exercise Questionnaire ranking second. All other questionnaires were used on only a single occasion. Although most interventions cited the measurements' reliability and validity, the proportion of studies providing evidence on specific measurement properties such as internal consistency, criterion validity, detailed reliability and validity parameters, and population-specific reliability and validity was insufficient. **Conclusion:** The IPAQ is the most extensively used tool among university students' PA interventions. The validation and documentation of its measurement properties require further improvement. Standardising PA questionnaires represents a strategic approach to enhancing their reliability and validity. This review's investigation offers theoretical backing for selecting and refining PA questionnaires, contributing to the field's advancement.

Physical Activity and Academic Performance of Chinese International Students in Universiti Malaya

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Objectives: According to the QS World University Rankings and data from EMGS, international students are playing an increasingly vital role on campus. This study aims to examine the academic performance (CGPA) and physical activity levels (measured using the IPAQ-SF questionnaire) of Chinese international students at UM. **Methods:** Convenience sampling involved distributing 304 questionnaires to Chinese international students at Universiti Malaya. Data analysis employed SPSS 24.0, encompassing descriptive statistics and ANOVA analysis. **Results:** Out of 304 distributed questionnaires, 231 were completed and returned, yielding a response rate of 76%. Respondents provided demographic details such as gender, age, college, highest education level, and expected graduation year. However, no significant correlation was found between academic performance (CGPA) and physical activity among Chinese international students at Universiti Malaya. **Conclusion:** This study reveals no significant relationship between physical activity and CGPA in the current sample. Further investigation into other potential factors and a deeper exploration of the physical activity-academic performance nexus are necessary. Limitations include the use of convenience sampling, restricting generalisability, potential gender bias due to the overrepresentation of female participants, subjective self-reported data, and the inability of the cross-sectional design to track longitudinal changes or establish causality within variables.

The Relationship Between Physical Activity and Quality of Life Among Middle School Students and High School Students in Shandong Province: A cross-sectional study of 2020

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Objectives: This study aims to explore the current status of physical activity (PA) and quality of life (QoL) among middle school and high school students in Shandong Province, investigate the relationship between them, and provide insights for improving the situation. **Methods:** Data from the Database of Youth Health (DYH) were utilised, focusing on students aged 7–18 in 2020. After excluding certain data points, the final sample size was 21,092 students from 10 cities. SPSS 26.0 was used to conduct descriptive analysis and T-tests of PA scores and QoL scores according to gender and study stage. Pearson analysis was conducted to assess the correlation. **Results:** The results show that girls had lower PA scores than boys in middle school, while high school boys had a higher percentage of scores. High school students had higher QoL scores than middle school students. Gender did not significantly affect QoL scores. There is also a positive correlation between PA and QoL. **Conclusion:** To promote these aspects, relevant departments should prioritise the development of youth sports, strengthen the quality management system of physical education classroom teaching, and encourage the implementation of diversified physical education methods. The study used data from Shandong Province, which may lack representativeness of the entire country. Additionally, since QoL has 13 dimensions, future studies could explore the potential differences between these dimensions in relation to physical activity.

Proprioceptive Neuromuscular Facilitation Improves Symptoms Among Older Adults with Knee Osteoarthritis During Stair Descending

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Objectives: This study aims to examine the effects of a 12-week Proprioceptive Neuromuscular Facilitation (PNF) intervention on pain relief, passive and active joint range of motion (ROM), external knee adduction moment (KAM), and hip adduction moment (HAM) in the elderly with knee osteoarthritis (KOA) during stair descent. **Methods:** This study is a randomised, controlled, and assessor-blinded trial. Thirty-six older adults with KOA were randomly assigned to the twelve-week PNF intervention group and the health lecture group. For the comparison of outcomes within and between groups, a two-way analysis of variance with repeated measures was applied. A significant p-value was considered to be less than 0.05. **Results:** Compared to the health lecture group, the PNF group showed a decreased pain score at week 6 ($P = 0.001$, Cohen's $d = 1.38$) and week 12 ($P < 0.001$, Cohen's $d = 2.13$). There was an increased passive hip, knee, and ankle ROM at weeks 6 ($P = 0.006, 0.010, 0.002, 0.010, \text{ and } 0.004$, Cohen's $d = 1.36, 0.96, 1.18, 0.84, \text{ and } 1.02$) and week 12 ($P = 0.002, < 0.001, < 0.001, 0.002, \text{ and } 0.004$, Cohen's $d = 1.41, 1.08, 1.61, 0.75, \text{ and } 0.82$). There was a decreased minimum knee flexion angle at week 6 ($P < 0.001$, Cohen's $d = 1.57$) and week 12 ($P < 0.001$, Cohen's $d = 1.81$) and increased HAM during stair descent at week 6 ($P = 0.029$, Cohen's $d = 0.59$) and week 12 ($P = 0.002$, Cohen's $d = 0.81$). **Conclusion:** PNF could be recommended as an effective treatment for KOA to relieve pain without increasing KAM, enhance passive ROM, increase active knee flexion ROM, and increase HAM during stair descent in the elderly with KOA.

The Effect of Knee Residual Rotatory Instability on Performance After Anterior Cruciate Ligament Reconstruction

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Objectives: The purpose of this study is to investigate the effect of rotatory stability on subjective outcomes and athletic performance after ACL reconstruction (ACLR), and to compare the magnitude of differences in subjective scores and performance between patients with positive and negative pivot shift tests (PST). **Methods:** A total of 66 patients who underwent ACLR surgery at the National Institute of Sports Medicine from November 2015 to November 2021 were reviewed and grouped into a stable group (SG, $n = 32$ with negative PST) and an unstable group (UG, $n = 34$ with positive PST) to compare participants' characteristics, subjective scores, and performances between the two groups. **Results:** The single-leg, triple- and cross-hop limb symmetry index and ACL-Return to Sport after Injury scores of the SG were significantly better than those of the UG (81.79 ± 29.34 versus 63.36 ± 36.58 ; 86.03 ± 27.53 versus

67.86 ± 35.42; 85.79 ± 26.54 versus 69.58 ± 36.56; 70.44 ± 22.82 versus 53.44 ± 21.74). The KT-2000 side-to-side difference (SSD) in the SG was significantly smaller than in the UG (0.53 versus 2.06 mm). The return-to-sport (RTS) rates for the SG and UG were 43.8% and 35.3%, respectively, with 14.3% and 8.3% of patients RTS safely, accounting for 6.3% and 2.9% of each group, respectively, although none of the differences were significant. **Conclusion:** Rotatory instability of the knee after ACLR results in significantly poorer performance in hop tests, psychological readiness, and more anteroposterior laxity. At short- and medium-term follow-ups after ACLR, RTS rates remained low regardless of knee rotational stability, with the majority failing to RTS safely.

Targeting the Coracohumeral Ligament: Advancing treatment strategies for adhesive capsulitis

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Objectives: Hydrodilatation of the glenohumeral joint has emerged as a preferred intervention for adhesive capsulitis. The recognition of the significance of the coracohumeral ligament (CHL) complex in shoulder stiffness has prompted surgical interventions such as concurrent CHL release during arthroscopic cuff repair to enhance shoulder function. Recently, ultrasound-guided injection targeting the CHL has gained attention as a potential avenue for focused therapy. **Methods:** A 59-year-old male with multiple medical comorbidities presented with atraumatic shoulder pain persisting for three months. He described insidious onset, progressive shoulder pain accompanied by stiffness and functional impairment. Clinical evaluation revealed generalised tenderness in the glenohumeral region, particularly over the anterior shoulder and long head biceps tendon (LHBT), along with global restriction in motion. Provocative tests elicited significant pain responses. Sports ultrasound depicted a thickened CHL, mixed echogenicity within the supraspinatus muscle, and an attenuated subacromial-subdeltoid bursa. Subsequent shoulder MRI confirmed high-intensity signals over the CHL, soft-tissue thickening within the rotator interval and joint capsule, indicative of adhesive capsulitis. The patient underwent intra-ligamentous injection of concentrated dextrose (40%), dexamethasone sulphate, and lignocaine targeting the pathological CHL. **Results:** The Shoulder Pain and Disability Index (SPADI) score improved from 70% (pre-injection) to 60% at 2 weeks post-injection and further to 40% at 1 month post-injection, with a corresponding improvement in Visual Analogue Scale (VAS) pain scores from 7 to 4 and 2, respectively. Incremental restoration of motion was observed. **Conclusion:** Intra-ligamentous injections targeting the CHL represent a promising therapeutic option for patients suffering from adhesive capsulitis.

Palmar Hand Ulnar Artery Aneurysm (Hypothenar Hammer Syndrome) in Kyorugi Taekwondo Athlete: A rare case report found during preparticipation physical evaluation

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Objectives: The preparticipation physical evaluation (PPE) must be performed before any athlete participates in competition. The general goals are determining general physical, musculoskeletal, cardiovascular, neurological, and psychological health; and evaluating for life-threatening or disabling conditions. The diagnosis of hypothenar hammer syndrome (HHS) should be considered in people who occupationally use the hypothenar region. Early diagnosis is important to prevent long-term negative medical sequelae. **Methods:** A 15-year-old male taekwondo athlete complained of a lump with pain and paraesthesia in the hypothenar area of the left hand for one year. On examination, there was no cyanosis or pallor. The lump measured 1.5 × 0.5 cm, was pulsating on palpation, and was tender. Colour Doppler ultrasound showed a focal fusiform aneurysm of the ulnar artery, 1.5 cm in length and 0.5 cm in diameter. The aneurysm interfered with his training and competition, so the patient underwent surgery. **Results:** A complete PPE should be performed before the athlete enters a new level of participation, 4–6 weeks before training begins. Generally, PPE is conducted prior to athletic performance, and athletes who are identified as unfit are subsequently excluded from or advised against participation and referred for medical consultation. In this case, HHS was detected early from examination during PPE, confirmed by colour Doppler ultrasound, and immediately followed by surgery due to the high risk of rupture, especially in a taekwondo athlete. **Conclusion:** All athletes are encouraged to undergo PPE. PPE helps to identify pathological conditions early, enabling timely intervention and management, with the hope of reducing future morbidity in athletes.

The Prevalence of Meniscal Injury in Knee Anterior Cruciate Ligament Tear Patients in a Tertiary Hospital in Malaysia

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Objectives: Isolated ACL tears occur in less than 10% of cases. ACL-associated injuries normally involve the meniscus, LCL, MCL, or articular cartilage. The lateral meniscus is often injured in acute ACL tears, while the medial meniscus is involved in chronic tears. This study aims to evaluate the prevalence of meniscal injury in ACL tears and the association of meniscal injury in acute and chronic ACL injuries. **Methods:** A retrospective cohort study was performed at Hospital Sultan Idris Shah, Serdang, Malaysia, from January 2022 to December 2023. Fifty-three patients who underwent diagnostic arthroscopy of the knee or arthroscopic primary ACL reconstruction surgery were included. Demographic data, mechanism of injury, time from injury to operation, and intraoperative findings were documented. ACL injuries occurring more than three months before surgery were classified as chronic, while those less than three months were considered acute. **Results:** The mean age of the study group was 31.28 ± 8.96 years. 56.6% of patients sustained injuries secondary to sports activities, 24.5% had falls, and 18.9% were due to motor vehicle accidents. 20.8% of patients had isolated ACL injuries, while 79.2% had associated meniscal injuries. The mean time from injury to surgery was 15.4 ± 16.6 months, ranging from 1 to 62 months. Only 34% of patients had surgery during the acute injury phase. A higher number of lateral meniscus injuries were found in acute injuries. The prevalence and sites of meniscal injury in acute and chronic ACL injury patients showed no significant differences ($P = 0.366$ and 0.559 , respectively). **Conclusion:** Early surgical intervention is suggested to improve patients' activities of daily living and function by reducing their symptoms.

Medical Encounters During the Malaysia Women Sports Carnival 2023

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Objectives: This study aimed to analyse medical encounters, including injury and illness, during the Malaysia Women Sports Carnival 2023. **Methods:** This cross-sectional study gathered data from the Women Sports Carnival held from 4–6 September 2023 at Universiti Tenaga Nasional, Malaysia. All medical encounters were documented via an electronic report form using Google Forms, based on the International Olympic Committee (IOC) injury and illness format for multi-sport events. The injuries and illnesses were diagnosed and reported by qualified medical personnel. **Results:** There were a total of 642 female athletes and 190 officials during the carnival. States with the highest numbers of injuries were Johor (n = 13, 14.3%) and Kedah (n = 13, 14.3%). The total number of medical encounters was 93, with athletes accounting for 98.9%. The incidence of injury and illness in athletes was 13.71 and 4.55 per 100 athletes, respectively. Most injuries occurred in soccer (n = 40, 45.5%), while illnesses primarily involved the gastrointestinal (n = 2, 40.0%) and respiratory (n = 2, 40.0%) systems. Knee injuries were the most common, with an average of six cases recorded per day. The most common nature of injury was contusion (n = 42, 47.2%), and the primary cause was trauma (n = 74, 84.1%). Four cases with moderate (n = 2, 2.2%) to severe (n = 2, 2.2%) injury severity required referral to a tertiary centre for further assessment. **Conclusion:** This women's carnival was classified as having a moderate number of medical encounters, with more injuries reported than illnesses. Organised sporting events need medical reporting to ensure the health of athletes and officials, especially among women.

Cross-Sectional Examination of 24-hour Movement Behaviour and Anxiety among Chinese Adolescents

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Objectives: 24-hour movement behaviour (physical activity, sedentary behaviour, and sleep) has consistently been linked with various favourable health outcomes during adolescence. However, given the scarcity of empirical evidence on the link between adherence to 24-hour movement guidelines and anxiety among Chinese school-aged adolescents, this study focuses on exploring this association. **Methods:** Cross-sectional data regarding 24-hour movement behaviour were obtained from 670 adolescents via the Health Behaviour in School-aged Children Survey. Anxiety was assessed using the Self-Rating Anxiety Scale. Logistic regression analysis was utilised to investigate the potential association between 24-hour movement behaviour patterns and anxiety. **Results:** Merely 2.1% of the participants fulfilled all three recommendations within the 24-hour movement behaviour guidelines, whereas 26.0% failed to meet any of them. Moreover, 8.2% of participants reported experiencing anxiety. Logistic regression analyses revealed that adherence to either the sedentary behaviour or sleep guidelines, or both, is significantly associated with a lower likelihood of experiencing anxiety compared to those who did not adhere to any guidelines. Conversely, meeting none of the 24-hour movement behaviour guidelines was markedly linked with an elevated risk of anxiety. **Conclusion:** The compliance of Chinese adolescents with recommended guidelines for healthy movement behaviour continues to be suboptimal. It is essential to recognise the holistic approach of 24-hour movement behaviour guidelines in mitigating anxiety among school-aged adolescents in China. Moreover, robust cross-sectional and longitudinal studies are warranted to further deepen our understanding in future research endeavours.

Changes in Musculoskeletal and Cardiovascular Health-related Fitness Parameters in Teenage Boys with Type 1 Diabetes Mellitus After 12 Weeks of Recreational Football and Calorie Control

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Objectives: Children with type 1 diabetes mellitus face barriers to engaging in physical activity. Moreover, it was not clear how recreational sport, along with a reduction in calorie intake, can help them improve some of their health parameters. The aim was to examine how recreational football, along with calorie control, affects musculoskeletal and cardiovascular health-related fitness in male adolescents with type 1 diabetes mellitus. **Methods:** Four groups with 10 participants each were created. The participants were randomly divided into the groups. One group underwent the football and calorie control intervention. The other 2 groups received only football or calorie control interventions, while the fourth group received no intervention. The duration of the intervention was 12 weeks, conducted twice a week, with each football game lasting for 1.5 hours. The tested fitness parameters were abdominal endurance, explosive strength, handgrip strength, trunk flexibility, and VO₂ max. Any changes were considered significant if $P \leq 0.050$ and the effect size (ES) was $\leq 42\%$ (low) or $\geq 58\%$ (high). **Results:** Only the group with football and caloric control experienced an increase in all parameters. The football group experienced increases only in explosive strength and handgrip strength. **Conclusion:** The study shows that recreational football is "one of the ways" to improve musculoskeletal and cardiovascular fitness parameters, even without diet control. However, adolescent boys with type 1 diabetes mellitus can experience improvements in these fitness parameters within 12 weeks if football is combined with diet control.

Bone Health in Champions: A cross-sectional analysis of bone mineral density in Malaysian team sports elite athletes

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Objectives: Poor bone health increases the risk of musculoskeletal injuries and influences the sports performance of athletes. Bone health can be assessed via BMD, a measure of mineral per unit area of bone tissue. This cross-sectional study aims to determine the prevalence of low BMD (z-score ≤ -1) among team sports athletes. **Methods:** From 2018 to 2020, DXA was used to measure BMD of the lumbar spine (L1–L5), hip, and whole body among 130 Malaysian team sports athletes (Hockey, n = 58; Sepak Takraw, n = 29; Basketball, n = 14; Rugby, n = 13; Netball, n = 10; Football, n = 6) who underwent medical check-up at ISN. **Results:** In this study, 70 male and 60 female athletes aged 24 ± 3 years old with a BMI of 23.1 ± 2.7 kg/m², average fat mass of 14.5 ± 4.7 kg, and lean mass of

49.1 ± 9.7 kg. Whole-body scans displayed an average BMD of 1.18 ± 0.1 g/cm² and a z-score of 0.3 ± 0.87 within the normal reference for age. Detailed spine analysis showed a mean BMD of 1.8 ± 7.6 g/cm² and a z-score of 1.04 ± 0.96. At the hip, the average BMD and z-score were 1.22 ± 0.18 g/cm² and 2.6 ± 1.21. Interestingly, hockey athletes demonstrated the highest hip z-scores, while rugby athletes had the highest spine z-scores. However, low BMD was found in 7.7% (n = 10) of the athletes, with seven of them being females and 70% being Sepak Takraw athletes. Conclusion: Overall, this study demonstrated good bone health in Malaysian team athletes, but regular monitoring and preventive measures are crucial to optimise bone health status.

HD-tDCS Affects Dynamic Balance in Middle-Aged and Older Adults: A randomised crossover trial

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Objectives: High-definition Transcranial Direct Current Stimulation (HD-tDCS) is a non-invasive brain stimulation technique that may enhance postural control by stimulating the primary motor cortex (M1), as indicated by recent research. This study aims to investigate the impact of HD-tDCS on dynamic postural control in middle-aged and older adults. **Methods:** Twelve healthy middle-aged and older adults (mean age 55.42 ± 4.83 years) participated in a randomised crossover trial, attending two laboratory sessions a week apart. Using the Bertec CDP/IVR system, participants performed the Rhythmic Weight Shift (RWS) test twice per visit, voluntarily shifting weight at specified rhythms (1, 2 and 3 sec. transitions) in designated directions. Centre of gravity sway velocity, measured in degrees per second, was compared against individual normative scores based on pace and direction. During each session, participants received either anodal or sham HD-tDCS stimulation over the M1 area (stimulation: Cz; return: CP1.CP2.FC1.FC2) in a randomised manner. Data analysis using repeated measures ANOVA revealed statistically significant differences in Movement Velocity (MVL) and directional control (DCL) in the forward and backward directions. **Results:** It indicates an interaction effect of time and intervention (MVL: $P = 0.003$, $\eta^2 p = 0.572$; DCL: $P = 0.044$, $\eta^2 p = 0.319$). Post hoc analysis demonstrated significant improvements following anodal stimulation compared to baseline (MVL: $P = 0.019$, MD = -0.4917; DCL: $P = 0.044$, MD = -6.5). However, no significant differences were observed in postural control in the left and right directions. **Conclusion:** Anodal transcranial direct current stimulation applied to the M1 region enhances postural control specifically in the anterior-posterior direction among middle-aged and older adults.

Impact of Reduced Plantar Cutaneous Sensation on Ankle Kinematics in People with Chronic Ankle Instability

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Objectives: This study aimed to investigate whether reduced plantar cutaneous sensation could influence movement strategies at the ankle in people with chronic ankle instability (CAI) during single-leg drop landing. **Methods:** Fourteen adults with CAI were recruited for this study (female: 6, age: 22.03 ± 1.73 years, height: 1.72 ± 0.11 m, body mass: 71.53 ± 15.49 kg). They executed three trials of single-leg drop landing from a 20-cm platform measured by a twelve-camera motion capture system and a force plate. The 20N threshold in vertical ground reaction force was used to determine the landing moment. The variables included angle, range of motion (ROM), and angular velocity. We assessed the effect of reducing plantar cutaneous sensation after a 10-minute ice immersion using a set of Semmes-Weinstein monofilaments. A paired-sample t-test was used to analyse data. **Results:** Maximum internal rotation angle (pre: 11.14 ± 3.44°; post: 10.16 ± 3.67°; $P = 0.018$, $d = 0.27$), ROM (pre: 16.63 ± 3.90°; post: 15.19 ± 3.27°; $P = 0.011$, $d = 0.40$), and angular velocity (pre: 353.50 ± 110.94°/s; post: 324.60 ± 116.25°/s; $P = 0.033$, $d = 0.99$) at the ankle were significantly decreased after acute ice immersion. These results of plantarflexion and inversion showed a decreased tendency without statistical difference ($P > 0.05$). **Conclusion:** The reduced plantar cutaneous sensation through acute ice-immersion intervention altered internal rotation kinematics at the ankle during drop landing in adults with CAI. These results indicate that a reduction in plantar cutaneous sensation could increase the potential risks of lateral ankle sprain.

The Effect of 16-week Tai Chi on Muscle Strength Among Older Adults of Different Ages

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Objectives: This study investigated the effect of 16 weeks of Tai Chi practice on muscle strength among older adults of different age groups. **Methods:** A total of 37 older adults participated in the study. Thirteen aged 60–69 in the younger-old group (YOG) (7 females, 65.6 ± 1.0 years, 163.8 ± 8.6 cm, 63.3 ± 10.1kg), 11 aged 70–79 in the middle-old group (MOG) (7 females, 73 ± 3.4 years, 158.7 ± 10.8 cm, 62.1 ± 9.0 kg), and 13 aged 80–89 in the older-old group (OOG) (8 females, 85.4 ± 2.6 years, 155.3 ± 2.8 cm, 61.1 ± 6.3kg) completed 16 weeks of Tai Chi practice for four sessions per week. Strength of hip abduction and ankle plantarflexion/dorsiflexion was measured using the IsoMed 2000 strength testing system before and after the practice, respectively. Mixed-model two-way ANOVAs were used for data analyses. **Results:** Significant practice effects for ankle plantarflexion ($P = 0.011$, $\eta^2 = 0.47$, $F(34,2) = 7.24$), dorsiflexion ($P < 0.001$, $\eta^2 = 0.176$, $F(34,2) = 30.127$), and hip abduction ($P = 0.045$, $\eta^2 = 0.113$, $F(34,2) = 4.325$) revealed an increase from week 0 to week 17. Significant group effects in ankle plantarflexion ($P = 0.003$, $\eta^2 = 0.293$, $F(34,2) = 7.036$), dorsiflexion ($P < 0.001$, $\eta^2 = 0.436$, $F(34,2) = 13.151$), and hip abduction ($P = 0.001$, $\eta^2 = 0.357$, $F(34,2) = 9.458$) indicated that OOG produced less peak torque for ankle plantarflexion ($P = 0.003$, $d = 0.932$), dorsiflexion ($P < 0.001$, $d = 0.965$) and hip abduction ($P < 0.001$, $d = 0.951$) than YOG, and for ankle plantarflexion than MOG ($P = 0.028$, $d = 0.894$). MOG also produced less peak torques than YOG for ankle dorsiflexion ($P = 0.024$, $d = 0.897$). **Conclusion:** Sixteen weeks of Tai Chi practice significantly increased muscle strength among older adults. Tai Chi practice offers a safe exercise option for older adults of different ages.

Deep Learning Approaches for the Detection of Knee Injuries from MRI Scans

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Objectives: Knee injuries represent a significant concern among athletes, leading to potential long-term disabilities and time away from sport. The complexity of knee structures and the subtlety of various injuries often make it challenging for medical professionals to accurately diagnose these conditions. This study aims to develop an efficient deep learning system for automatically detecting knee abnormalities from MRI scans, thus contributing to early diagnosis and treatment strategies for athletes and enhancing patient care.

Methods: Convolutional neural networks (CNNs) were utilised to process a large dataset (+150,000 MRI slices, 890 MRI volumes), annotated by clinicians from UCSF University. The dataset included an equitable representation from both genders and covered scans from both left and right knees, ensuring a comprehensive approach to model training and validation, setting a new standard in diagnostic accuracy for knee injuries. **Results:** The CNN model achieved an accuracy rate exceeding 96%, showcasing its potential to significantly enhance diagnostic processes. The model was further validated on a set of 177 knee scans, including both males and females and encompassing both knee sides, thereby confirming its effectiveness and applicability in diverse clinical scenarios.

Conclusion: Leveraging deep learning for the detection of knee injuries from MRI scans represents a ground-breaking step forward in sports medicine. The model's high precision and reliability can aid medical professionals in identifying injuries more swiftly and accurately, offering a substantial improvement over traditional diagnostic methods. The adoption of such advanced diagnostic tools could transform patient care, leading to better outcomes and quicker post-injury recoveries.

The Impact of Low-level Laser Therapy and Light-Emitting Diode Therapy on Athletic Performance: A systematic meta-analysis

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Objectives: Low-level laser therapy (LLLT) and light-emitting diode therapy (LEDT) have emerged as non-invasive physical treatment modalities attracting considerable interest for clinical applications, particularly in enhancing athletic performance. Despite their growing popularity, there remains significant debate within the academic community about their efficacy. This meta-analysis aims to systematically review the literature, specifically assessing the effects of LLLT and LEDT on athletic performance by focusing on power output-related outcome measures. **Methods:** A systematic search was performed up to February 2024, across four major databases: Web of Science, PubMed, Embase, and CNKI, to identify relevant studies. We applied stringent inclusion and exclusion criteria for literature screening, assessed the quality of the selected studies using the Cochrane risk of bias tool, and conducted statistical analysis using Review Manager software. **Results:** The search yielded 488 articles. After removing duplicates, conducting preliminary screening, and reviewing full texts, 5 articles were selected for meta-analysis. The results revealed that LLLT did not significantly affect peak power (MD = 20.76, 95% confidence interval [CI]: -54.90-96.41, Z = 1.06, I² = 0%; P = 0.59) or average power (MD = 3.14, 95% CI: -48.49-55.44, Z = 0.13, I² = 0%; P = 0.90). Similarly, no significant effects were observed for LLLT and LEDT on peak relative power (MD = 0.11, 95% CI: -0.26-0.47, Z = 0.59, I² = 0%; P = 0.56) or average relative power (MD = 0.06, 95% CI: -0.19-0.31, Z = 0.45, I² = 0%; P = 0.65). **Conclusion:** This meta-analysis concludes that LLLT and LEDT do not significantly enhance exercise output power. Therefore, pre-exercise interventions using these therapies do not immediately improve anaerobic metabolic capacity, explosive strength, or speed endurance in athletes.

A Randomised Crossover Trial of a Study on the Effect of the Chinese Traditional Health Qigong of Baduanjin on the Immediate Recovery of Exercise Fatigue

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Objectives: This study aimed to explore the effects of traditional Chinese health Qigong, Baduanjin, on immediate recovery after exercise-induced fatigue. **Methods:** Twenty students from Beijing Sport University were recruited for this study and randomly assigned to either Baduanjin or slow walking for recovery immediately after fatigue induction on a treadmill, with a one-week washout period. The primary indices were heart rate at the immediate end of exercise (HR1) and immediately post-intervention (HR2), subjective fatigue scale (RPE), while secondary indices included respiratory mean power and lower limb muscle flexibility (quadriceps, hamstrings, calf triceps, and gluteus maximus). **Results:** Before and after Baduanjin intervention, significant recovery effects were observed in immediate heart rate (HR1: 184.50 ± 6.33 BPM versus HR2: 102.25 ± 8.69 BPM; P < 0.001) and RPE (17.10 ± 0.64 versus 8.75 ± 0.97; P < 0.001). Additionally, lower limb muscle flexibility, including popliteus (61.65 ± 11.69° versus 65.15 ± 9.55°; P = 0.004), quadriceps (11.48 ± 4.07 cm versus 10.36 ± 3.52 cm; P = 0.001), and calf triceps (15.59 ± 15.21 cm versus 17.43 ± 16.55 cm; P = 0.002), showed significant recovery effects. Slow walking also demonstrated significant recovery effects on immediate heart rate (HR1: 181.70 ± 5.33 BPM versus HR2: 102.90 ± 14.35 BPM; P < 0.001), RPE (17.25 ± 0.72 versus 9.05 ± 1.10; P < 0.001), and calf triceps flexibility (11.55 ± 3.89 cm versus 12.61 ± 3.49 cm; P = 0.001). Comparing pre- and post-intervention differences between groups revealed that Baduanjin was superior to slow walking for immediate flexibility recovery of the quadriceps (-1.115 ± 1.314 cm versus 0.280 ± 0.668 cm; P = 0.001) and hamstrings (3.50 ± 4.74 cm versus -0.90 ± 5.65 cm; P = 0.026). **Conclusion:** Both Baduanjin and slow walking are effective, with Baduanjin showing promise for immediate recovery from exercise-induced fatigue in future applications.

A Study on the Current Situation of Physical Activity Among Senior Intellectuals in Universities and its Relationship with Physical Health

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Objectives: Investigating the relationship between the physical activity level and physical health of senior intellectuals in universities provides a scientific basis for enhancing their physical activity level and formulating specific measures to improve their physical health in the future. **Methods:** This study employs an international physical activity questionnaire to assess the current level of physical activity

participation among senior intellectuals. A comprehensive assessment is conducted on their physical health status, including lung capacity, step test, grip strength, and sitting forward bending. Differences between physical activity levels and various physical health test indicators are compared. SPSS software and logistic regression methods are utilised to analyse the influencing factors of physical activity, followed by Pearson correlation analysis on the overall evaluation results of physical fitness test scores and physical activity levels. **Results:** According to the survey, 74 individuals (48.7%) participated in low physical activity, while 42.8% and 8.5% engaged in medium and high physical activity, respectively. Logistic regression analysis identified the primary factors contributing to low physical activity, including title pressure, work intensity, gender, duration of each exercise, and number of weekly exercises. The bilateral significance level of the scores for physical health testing compliance level and physical activity level is $P < 0.01$, with a Pearson correlation coefficient of 0.437, indicating a moderate positive correlation between the two. **Conclusion:** Senior intellectuals predominantly engage in low-intensity and moderate-intensity physical activities. Those who engage in high physical activity exhibit superior cardiovascular function, flexibility, muscle strength, and reaction ability among senior intellectuals.

Validation and Reliability of Environmental Cues Malay Version for Physical Activity Intervention for Adolescents

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Objectives: While intervention using exercise is not new, its impact on adolescents' engagement with exercise remains limited. Therefore, this study aimed to examine the validity and reliability of the Environmental Cues Malay Version, which can be utilised in physical activity interventions among adolescents. **Methods:** The Environmental Cues Malay Version (EC-M) was developed following validation protocols, involving five phases: (a) searching for relevant literature; (b) item development; (c) expert evaluation using the content validity index (CVI) method; (d) face validation; and (e) pilot study. The pilot survey was administered online (cross-sectional design) to 103 adolescents, with responses collected through a binary method. **Results:** We developed 100 items comprising 50 active and 50 sedentary images. Content validation involved expert review, with seven experts in the field participating. The Content Validation Index (CVI) was calculated for each item, with values ranging from 0.7 to 1. The average CVI (S-CVI/Ave) was 0.8, indicating an acceptable value. An item was retained if it achieved a CVI of at least 0.7, signifying agreement among a substantial majority of experts regarding its relevance. Minor amendments were made based on feedback from respondents during face validation. The internal consistency of the measurement instrument was assessed using Cronbach's alpha coefficient, yielding a value of 0.96, indicating strong reliability. **Conclusion:** In conclusion, EC-M demonstrates good reliability and validity properties. These findings highlight the importance of incorporating validated images into intervention materials aimed at promoting physical activity among adolescents.

Medication Use in Para Athletes During Asean Para Games: Insight from an Indonesia National Team Doctor

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Objectives: Medication use among athletes requires special attention due to the stringent conditions set by regulations and the World Anti-Doping Agency's (WADA) prohibited list and monitoring programme. Para-athletes, with certain conditions that predispose them to increased risks such as pain, metabolic changes, and injury, require particular consideration. Therefore, our aim is to report on medication use in para-athletes during the ASEAN Para Games (APG) 2022 in Solo to provide reference for future major multi-sport events. **Methods:** This is a retrospective, descriptive study. Data were collected during APG 2022 in Solo from para-athletes of the Indonesian contingent who received medication treatment from the Indonesia National Team Doctor, both on and off the field. **Results:** The team doctor prescribed a total of 63 medicines, with seven physiatrists responsible for fourteen sports programmes. Of these, 17 were acetaminophen and/or analgesics (27%), 10 were expectorants (15%), 8 were atropine (12.7%), and 6 were anti-emetics and loperamide (each accounting for 9.5%). **Conclusion:** Medication use during the APG varied significantly among Indonesian para-athletes. The most commonly used medication was acetaminophen and/or analgesics, reflecting the prevalence of fever and pain during major multi-sport events due to exhaustion, injury, potential injury, or dehydration. These conditions can also lead to the common cold and cough; hence expectorants were the second most commonly used medication. Food alterations, strict competition times, and stressful conditions can lead to metabolic changes and diarrhoea among para-athletes, necessitating the use of atropine, anti-emetics, and loperamide during the event. Importantly, none of the prescribed medicines were on the WADA prohibited list.

Causality Between Diabetes Mellitus and Rotator Cuff Injury: A Mendelian randomisation study

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Objectives: While the potential association between diabetes and rotator cuff injury (RCI) has been acknowledged, the precise nature of this relationship remains uncertain. Hence, the primary objective of this research is to examine the potential causal association between diabetes mellitus and the likelihood of experiencing RCI, along with an analysis of the pertinent supporting data. **Methods:** This Mendelian randomisation (MR) study employed 25 independent genetic variants associated with diabetes as instrumental variables, sourced from the genome-wide association study (GWAS), including 6 for type 1 diabetes, 16 for type 2 diabetes, and 3 for fasting glucose. The GWAS datasets were obtained from the IEU, which includes studies from the EBI and Finn. MR estimates from each genetic instrument were combined using inverse variance-weighted analysis and other methods like weighted median, MR Egger, MR-fold residuals, and PRESSO. **Results:** The findings of the MR study indicated a positive association between a specific type 1 diabetes GWAS and rotator cuff injury, with a significance level of $P = 0.03$. Nevertheless, the odds ratio (OR) of 1.02 (95% confidence interval: 1.00–1.04) indicates a minimal effect size. There was no evidence to suggest a causal relationship between RCI and any of the

remaining diabetes complications, including type 2 diabetes, fasting glucose levels, and the remaining five subtypes of type 1 diabetes. **Conclusion:** This study found no direct link between diabetes or fasting glucose and RCI, contradicting conventional beliefs. Type 1 diabetes, type 2 diabetes, and fasting glucose abnormalities do not appear to directly impact rotator cuff injuries.

Long COVID Syndrome in Athletes

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Objectives: This study aims to investigate the prevalence, clinical manifestations, and impact of Long COVID syndrome (LCS) on athletes' physical and mental health, performance, and return to sports. **Methods:** A retrospective cohort study was conducted involving athletes who had experienced COVID-19 infection. Participants underwent comprehensive medical evaluations. LCS was assessed using standardised questionnaires and clinical interviews. Athletes' performance metrics, such as endurance, strength, and aerobic capacity, were evaluated pre- and post-infection. Data were analysed using descriptive statistics and comparative analyses to identify differences between athletes with and without LCS. **Results:** A total of 121 athletes with a history of COVID-19 infection were included. Twenty-eight percent of athletes reported experiencing LCS, including fatigue, dyspnoea, myalgia, and cognitive impairments. Cardiac abnormalities, such as myocarditis and arrhythmias, were identified in 9% of athletes with LCS. Athletes with LCS demonstrated significant declines in physical performance measures compared to their pre-infection baseline and to athletes without LCS. Additionally, psychological distress, including anxiety and depression symptoms, was more prevalent among athletes with LCS. **Conclusion:** LCS poses significant challenges to athletes' physical and mental health, performance, and return to sports. The high prevalence of persistent symptoms and cardiac abnormalities underscores the need for comprehensive medical evaluations and cardiac screening in athletes recovering from COVID-19. The decline in physical performance measures highlights the potential long-term consequences of LCS on athletic performance and the importance of tailored rehabilitation programmes. This study highlights early recognition, multidisciplinary management, and ongoing monitoring of LCS in athletes to mitigate its detrimental effects on their health and athletic careers.

Association of Nutrition Practice with Running Performance Among Hong Kong Marathon 2024 Participants

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Objectives: The purpose of this study is to investigate the association of nutrition practice with endurance running performance among participants of the Hong Kong Marathon (HKM). **Methods:** This cross-sectional study was conducted among recreational runners. Eighty participants were randomly selected from the marathon finishers list and surveyed if they met the inclusion criteria. Running performances were assessed using the results of the HKM. The questionnaire consisted of 15 statements with "YES" or "NO" answers for analysis. Each positive answer scored "1" and negative answers scored "0". The median score was used as the cut-off to determine good or poor nutrition practice. **Results:** The relationship between nutrition practice and running performance was negative, indicating that these variables did not tend to increase together; greater nutritional practice was associated with shorter running times. Among the 80 participants, 72.5% (58/80) were male, and the remaining were female. Of the participants, 33.8% (27/80) had poor nutrition practice scores. The mean \pm standard deviation (SD) score for nutrition practice was 8.3 ± 2.1 , and the mean \pm SD completion running time was 238.0 ± 50.4 minutes. Males had a poor nutrition practice score of 25.9% (15/58) compared to females, which was 54.5% (12/22). **Conclusion:** The study reveals poor nutrition practice among female marathon finishers compared to male marathon finishers in the HKM. Further research is essential to explore the association between nutrition practice and endurance running performance among athletes of different distances.

Overuse Injuries in Field Hockey: A pilot study on prevalence and severity of injuries among Indian field hockey players

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Objectives: In field hockey, the penalty corner accounts for about one-third of all team goals. The drag flick is the preferred method for converting a penalty corner, as there are no height restrictions. Previous studies have identified drag flickers (DF) as being at a higher risk of developing lower back and hip overuse injuries. However, the prevalence of injuries among Indian DF has not been investigated. This study aimed to examine the pattern of overuse injuries and their association with training hours among Indian DF and non-drag flickers (NDF). **Methods:** We surveyed 100 players using an online questionnaire to retrospectively determine the three-month prevalence rate of lower back, hip, knee, and ankle overuse injuries. A modified OSRTC-O questionnaire was then used to obtain severity scores among the injured players. **Results:** Out of 100 players, 36 were DF (mean age 25.3 years), and 64 were NDF (mean age 26.5 years). The overall prevalence rate was 55.5% in the DF group, with the lower back being the most commonly involved area (mean severity score 42/100). In the NDF group, it was 18%, with the knee being most commonly involved (mean severity score 41/100). A significant positive correlation was noted between lower back injury severity scores and drag-flicking training hours per week. **Conclusion:** Our study reveals that the prevalence of lower back and lower limb overuse injuries is greater among Indian DF than NDF. Monitoring drag-flicking training hours and ensuring adequate rest and recovery could play a role in reducing overuse injuries among DF.

The Influences of Time from Injury to Surgery on Anterior Lateral Rotational Instability in Patients with Anterior Cruciate Ligament Rupture

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Objectives: To investigate the differences in Anterior Lateral Rotational Instability (ALRI) in patients with anterior cruciate ligament rupture reconstructed in different periods. **Methods:** We conducted a retrospective analysis of 791 unilateral ACL-injured patients (544 male and 247 female, mean age: 30.88 ± 10.46 years). The pivot-shift test was performed before ACL reconstruction under

general anesthesia. Patients were divided into 4 groups according to chronicity: group 1, within 3 months (393 patients); group 2, between 3 and 6 months (112 patients); group 3, between 6 and 12 months (126 patients); and group 4, between 12 and 24 months (160 patients). A comparative study was conducted on gender, age, Beighton score, BMI, result of pivot-shift, the posterolateral tibial slope, the preoperative injury frequency, and the presence of posterior third meniscal tears. Results: There was no significant difference in demography between groups of different chronicity. No significant difference in the posterolateral tibial slope ($F = 0.102$; $P = 0.959$) was observed between the 4 groups, but the frequency of preoperative injury and the presence of tears in the posterior third of the menisci (medial: $\chi^2 = 92.106$; $P < 0.001$; lateral: $\chi^2 = 86.037$; $P < 0.001$) were significantly different between groups. Similarly, the grade of pivot-shift ($\chi^2 = 253.577$; $P < 0.001$) was also significantly different. The incidence of posterior third menisci tears and high-grade pivot shift test (grade 3) was significantly greater in group 4 compared to the other three groups. Conclusion: As the time from injury to surgery prolongs, the number of injuries and meniscus injuries increases, the incidence of high-grade pivot-shift increases, and severe anterior lateral rotational instability (grade 3) is more likely to occur.

Enhancing Gender Equity in Early Childhood Movement and Fitness Through Enjoyment: *Bridging the Gap*

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Objectives: This study examines gender differences in Fundamental Movement Skills (FMS) and Physical Fitness (PF) among 389 preschool children in Nanchang, China. It aims to uncover how gender impacts FMS and PF levels and the role enjoyment plays in physical activity participation, striving for gender-equitable development in early childhood physical education. **Methods:** FMS and PF were assessed, with a gender-based performance analysis. The study also explored the link between the enjoyment of physical activities and engagement levels. **Results:** Data revealed that boys, particularly those aged 5–6, outperformed girls in FMS and PE, particularly in locomotor and ball skills. Boys also showed greater enjoyment, which correlated with higher engagement. Enjoyment emerged as a key factor influencing both FMS and PF, establishing its importance in participation rates. **Conclusion:** Findings suggest a need for gender-responsive strategies in early physical education to bridge the developmental gender gap. Promoting enjoyable and inclusive physical activities tailored to children's diverse needs can encourage equitable development and a sustained interest in health and fitness.

Effects of Exercise Interventions on Systemic Inflammation in Elderly Patients with Cognitive Impairment: *A systematic review based on randomised controlled trials*

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Objectives: This paper reviewed the effects of exercise intervention on inflammatory factors in patients with mild cognitive impairment (MCI) and Alzheimer's disease (AD). **Methods:** PubMed, Web of Science, Embase, Cochrane, and EBSCO databases were searched using the following strategies: {"Alzheimer Disease or Presenile Dementia"} and {"Resistance or High-Intensity Interval Training or Swimming or Running or Physical Activity or Aerobic Exercise or Sports"} and {"Neurogenic Inflammation or Inflammation"}. Inclusion criteria: (1) AD patients were diagnosed according to NINCDS-ADRDA, and MCI patients were evaluated according to MMSE scale score ≥ 24 and < 26 . **Results:** A total of 3124 literatures were retrieved, and 6 literatures were included. The overall study quality was medium. Six studies were conducted in older adults with MCI ($n = 3$) and AD ($n = 3$). For MCI and AD patients, aerobic exercise can effectively reduce the expression of pro-inflammatory factors, such as IL-6 ($P < 0.01$), TNF- α ($P < 0.01$), IL-8 ($P < 0.01$), and other indicators, but the effect of anti-inflammatory factors is not significant. The expression levels of pro-inflammatory factors TNF- α ($P < 0.01$), IL-15 ($P < 0.01$), IL-8 ($P < 0.01$), IL-6 ($P < 0.01$), and IL-1 β ($P < 0.05$) were significantly reduced by anti-resistance exercise, and the effect of anti-resistance exercise on IL-15 was more significant. The effect of aerobic exercise on IL-6 is more obvious. **Conclusion:** Both aerobic exercise and anti-resistance exercise can significantly reduce the levels of pro-inflammatory factors in patients with MCI and AD, and effectively reduce the systemic inflammation in patients with cognitive impairment. Besides the traditional treadmill and elliptical, Tai Chi as aerobic exercise has also been proved to significantly reduce the systemic inflammation level in patients with cognitive impairment.

Investigating the Association between Emotional Regulation Strategies and Emotional Intelligence among Gen Z Sepak Takraw Athletes: *A case study*

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Objectives: Emotional intelligence (EQ) encompasses comprehending and managing personal and others' emotions. Emotional regulation pertains to controlling and adapting emotional responses. Given the challenges faced by Generation Z athletes in team sports, understanding how they navigate their emotional experiences is crucial. The research aims to contribute to this understanding by exploring the association between emotional regulation strategies and emotional intelligence among Gen Z Sepak Takraw elite athletes. **Methods:** A descriptive research design employing a purposive sampling method to select a sample of 14 Generation Z Sepak Takraw elite athletes (7 male, 7 female; Mage 22.2). Participants were chosen based on their age and experience in the sport from the National Sports Institute Centre in Malaysia. The research entailed semi-structured interviews to investigate athletes' emotional regulation strategies, categorising them into intrapersonal and interpersonal emotional regulation strategies. Open-ended questions were utilised to delve into participants' emotional regulation techniques, implementation methods, perceived impacts on EQ, and performance. **Results:** In this research, intrapersonal and interpersonal emotional regulation strategies encompass self-reflection, cognitive reappraisal, progressive muscle relaxation, social support seeking, conflict resolution, and the utilisation of verbal and non-verbal cues. The findings illuminate that athletes endowed with heightened emotional intelligence (EI) exhibit proficiency in deploying adaptive emotional regulation techniques, fostering enhanced performance outcomes, and cultivating favourable team dynamics. Conversely, individuals disregarding their emotional experiences resort to emotion avoidance behaviours. **Conclusion:** Incorporating emotional regulation training into sports programs emphasises the need for further research on intrapersonal and team strategies to enhance emotional intelligence and control.

Relationship Between Mental Toughness and Mental Energy in Sarawak Youth Athletes

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Objectives: This study investigated the relationship between mental toughness and energy among Sarawak youth athletes in Sarawak, Malaysia. Although there have been studies examining mental toughness in sports, there are still limited studies that examine the relationship between mental toughness and mental energy among youth athletes in sports. Thus, this study aims to fill this gap by investigating mental toughness and mental energy among youth athletes in sports. **Methods:** A total of 421 athletes (289 males, 132 females) aged between 13 to 18 completed the Malaysia Mental Toughness Questionnaire (MMTQ-28) and Athletic Mental Energy Scales (AMES). Descriptive analysis, one-way ANOVA and correlation were conducted. **Results:** Results revealed that there was a significant difference between age groups in commitment ($P = 0.014$), vigor ($P = 0.002$), confidence ($P = 0.002$), motivation ($P = 0.014$), concentration ($P = 0.034$), and calm ($P = 0.005$). The findings showed a significant positive relationship between MMTQ-28 and AMES variables that ranged from 0.336 to 0.784. **Conclusion:** This means that Sarawak youth athletes with higher levels of mental toughness tend to have higher levels of mental energy. This implies that higher levels of mental toughness result in higher levels of mental energy. The results suggest that coaches need to implement effective mental skills training to increase the level of mental toughness and energy, enhancing the athletes' performance.

The Social Support When Returning to Sport: Does athlete identity play a mediating role?

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Objectives: Athlete identity, a contentious factor in the Integrated Model of Response to Sport Injury (IMRSI), was studied concerning psychological rehabilitation. This research aimed to explore relationships among injured athletes' identity, social support, and psychological readiness for return to sport (RTS). **Methods:** Measurements, translated into Chinese, were validated with 30 athletes in Stage 1. In Stage 2, 234 injured athletes (male: $n = 194$, female: $n = 40$; age: 18–28, mean age = 19.28 ± 1.98) completed translated measures and the Chinese Multidimensional Scale of Perceived Social Support. **Results:** Positive correlations were found between social support and athlete identity, and social support and psychological readiness. However, no link was found between athlete identity and psychological readiness, challenging IMRSI's predictive power. Possible explanations include IMRSI's inability to predict athlete identity's role in psychological readiness at RTS stage, and limitations of the uni-dimensional I-PRRS in capturing psychological readiness constructs. **Conclusion:** Conflicting findings stress the need for further exploration of models and measures related to psychological readiness for RTS. Additionally, practical suggestions for offering real support during injured athletes' RTS stage are provided.

Characteristics of Motor Abilities and Promotion Strategies for Children with ADHD

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Objectives: Attention-Deficit Hyperactivity Disorder (ADHD) is a neurodevelopmental disorder. While exercise benefits ADHD children's core symptoms and executive functions, their motor abilities have received little attention. This study aims to explore motor ability characteristics in ADHD children, offering insights for personalised exercise prescriptions. **Methods:** In 2023, motor ability tests were conducted on 3–6-year-old ADHD-diagnosed children from hospital outpatient departments. Using MABC-2 and the National Physical Fitness Standards-2000 (NPPFS-2000), criteria included a WISC score ≥ 70 and no motor impairments. An ADHD group ($n = 45$) and a matched control group ($n = 40$) were compared. **Results:** No significant difference in fine motor skills between the ADHD group (AG) and the control group (CG). AG significantly weaker in aiming and grasping performance compared to CG. AG's body balance average score was lower than CG's, but not significant. Average Total Score of MABC-2 was lower in AG compared to CG, but not significant. In NPPFS-2000, AG's two-legged continuous jump score was lower than CG's, but not significant. There were no significant differences in other test items. **Conclusion:** Children with ADHD demonstrate significant weaknesses in positioning and grasping compared to their typically developing peers, while balance and coordination may also be deficient. This informs intervention strategies for ADHD training programmes. Integrating exercise with other ADHD interventions, like cognitive-behavioural therapy, holds promise for further exploration.

Evaluating the Effectiveness of Cold-Water Immersion as a Recovery Treatment in Female Football Players: An experimental study

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Objectives: The research aims to assess the impact of cold water immersion on interleukin-6 and creatine kinase levels in female football players post-exercise. This intervention is crucial due to the muscle tissue damage caused by physical exertion, which can lead to elevated levels of these markers, potentially causing fatigue and metabolic disorders. Cold water immersion is a common intervention used to mitigate these effects and accelerate recovery. The study seeks to determine the effectiveness of cold water immersion in promoting recovery among female football players. **Methods:** The research uses an experimental design with two groups: one undergoing cold water immersion and the other thermoneutral water immersion. There are 20 participants selected through purposive sampling. Blood serum is collected post-exercise to assess changes in interleukin-6 and creatine kinase levels. **Results:** The test results for the effect of interleukin-6 in both groups yielded a significance value of 0.05 in the control group and 0.001 in the intervention group. Meanwhile, in the creatine kinase effect test, the control group got 0.04 and 0.001 for the intervention group. Based on the difference in test results on the influence of interleukin-6 and creatine kinase levels in the two groups, a significance value of 0.000 was obtained. **Conclusion:** The research indicates that cold water immersion has a significant impact on interleukin-6 and creatine kinase levels compared to the control group. It also suggests that cold water immersion accelerates recovery in female football athletes following physical exercise.

Effects of Pilates Training on Vaginal Delivery Outcomes: A systematic review and meta-analysis

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Objectives: Labour pain and duration are significant factors affecting the quality of life for expectant mothers. Exercise during pregnancy is essential for maintaining maternal health and preparing for labour. Pilates, known for enhancing core strength and flexibility, may influence these labour outcomes. This systematic review and meta-analysis aim to determine the effects of Pilates training on labour pain and duration during vaginal delivery. **Methods:** We conducted searches in PubMed, Science Direct, and Scopus up to January 2, 2024, including RCTs and cohort studies published in English or Indonesian from 2001 to 2023. The primary outcome was labour pain measured by the Visual Analogue Scale (VAS), and the secondary outcome was the duration of labour. **Results:** The review included five studies with a total of 409 participants. For labour pain, three studies indicated that Pilates significantly reduced pain scores during labour (mean difference: -1.13 , 95% confidence interval [CI]: -1.64 – -0.61) with moderate heterogeneity ($I^2 = 68\%$). For labour duration, Pilates was associated with a significant reduction in the duration of labour (mean difference: -97.84 minutes, 95% CI: -136.70 – -58.98), with negligible heterogeneity ($I^2 = 0\%$). **Conclusion:** Pilates training appears to significantly reduce the duration of labour. The data suggest a potential reduction in labour pain, although heterogeneity and limited data suggest further research is warranted.

The Impact of Instagram-Based Exercise Promotion on Physical Fitness and User Satisfaction Among Sedentary Adults in the Klang Valley, Malaysia

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Objectives: In Malaysia, the prevalence of sedentary lifestyles has led to a concerning rise in non-communicable diseases, primarily due to physical inactivity. Recognising the potential of social media, especially platforms like Instagram, in promoting exercise, this study endeavours to assess its influence on physical fitness and satisfaction levels among adults residing in the Klang Valley, Malaysia. **Methods:** Fifty participants (32 females, 18 males) actively participated in a 12-week intervention programme, conducted via a specialised Instagram page titled 'Fit.spiration_study.' The intervention involved the dissemination of bi-daily cardiorespiratory-focused exercise content. Pre- and post-intervention evaluations encompassed anthropometric measurements, the 6-Minute Walk Test (6MWT), and completion of the Client Satisfaction Questionnaire-8 (CSQ-8). **Results:** There is a significant improvement in body weight ($P < 0.01$), BMI ($P < 0.01$), body fat percentage ($P < 0.01$), and 6-MWT distance ($P < 0.01$) post-intervention. Participants reported high satisfaction scores; mean total CSQ-8 score: 27.02 ± 4.91 and overall satisfaction score: 3.34 ± 0.85 . Notably, females demonstrated a greater reduction in BMI (-0.92 ± 1.22 versus -0.68 ± 0.90) as well as exhibited superior gains in endurance (71.31 ± 46.52 versus 61.61 ± 28.11) compared to males. Overall satisfaction and total CSQ scores were significantly associated with improvements in key health metrics, including body weight, BMI, body fat percentage and 6MWT. **Conclusion:** This study highlights the potential use of Instagram-based interventions in enhancing health and fitness. Further research for tailored and sustainable health promotion strategies on social media is encouraged to motivate sedentary adults to adopt a more active lifestyle.

Advancements in E-Sports Athlete Health: Injury screening strategies and implications

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Objectives: E-sports has transformed competitive sports, attracting diverse athletes engaged in extensive gaming sessions. Despite its growth, research on the physiological challenges and injury risks in E-sports is lacking. This study aims to fill this gap by proposing an injury screening regimen tailored for E-sports players, focusing on early detection and prevention. **Methods:** Conducted at Sri Ramachandra Centre for Sports Science, this cross-sectional descriptive study involved 55 E-sports athletes from a state-level Battle Grounds Mobile India (BGMI) tournament. Baseline assessments covered anthropometrics, musculoskeletal evaluations, and ergonomic analysis of gaming setups. Data on participation duration, injuries, ocular health, nutrition, psychological factors, and family cardiac history were collected and descriptively analysed. **Results:** Neck, back, and wrist pains were common, affecting 17, 15, and 11 athletes respectively. Eye-strain was reported by 21 athletes, particularly those with over 2 years of experience (16 out of 21). Symptoms included headaches, blurry vision, and fatigue lasting for hours. Only 8 athletes used protective glasses. Regarding nutrition, 29 athletes consumed adequate protein, while 21 relied mainly on carbohydrates. Seventeen athletes consumed over 2 cups of coffee daily for stimulation, and 31 slept less than 8 hours, associated with higher physical and mental stress. **Conclusion:** Many amateur E-sports athletes demonstrated suboptimal nutrition and lifestyle practices compared to professionals. Improving diet, ensuring adequate sleep, and maintaining an exercise routine can enhance cognitive functions, reflexes, and endurance essential for optimal gaming performance.

Development and Evaluation of a Gymnastics Training Module for Enhancing Fundamental Movement Skills in Primary School Physical Education

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Objectives: Incorporating gymnastic skills into physical education benefits children's development of Fundamental Movement Skills (FMS), such as improved balance, coordination, and motor competence. However, there is a limited availability of support materials for physical education teachers who want to conduct basic gymnastics activity sessions in Malaysia. This study aims to develop a Gymnastics Training Module based on the Primary School Standard Curriculum to assist Physical Education teachers. **Methods:** A Design and Development Research approach was employed. Phase 1 involved a needs analysis through Focus Group Discussions with new and experienced Physical Education teachers ($n = 10$). Phase 2 utilised the Fuzzy Delphi Method to determine the module's main components, involving experts ($n = 16$). Phase 3 evaluated the module's usability level through the Modified Nominal

Group Technique with Physical Education experts (n = 21). **Results:** The findings of phase one generated three themes: (I) flexible modules; (II) supporting materials; and (III) comprehensive content. Phase two identified six components: (I) objective; (II) content; (III) strategy; (IV) activities; (V) application; and (VI) module evaluation. In phase 3, experts evaluated the module's usability level. The percentage value of the acceptance score for the whole aspect exceeded 70.0%, with the findings for each aspect being usefulness (minimum = 88.57%), satisfaction (minimum = 94.29%), and ease of use (minimum = 89.52%), which are considered suitable and can be used. **Conclusion:** The Gymnastics Training Module for Primary School Physical Education is a suitable support material for teachers. Enhancing teacher preparation and professional development focused on foundational gymnastic competence could improve skill acquisition outcomes.

Malaysian Coaches' Perception of the Implementation on Sports Psychology Services during Athletes' Daily Training

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Objectives: The aim of the study was to examine the Malaysian coach's perception of the implementation of sports psychology services during athletes' daily training. **Methods:** This research utilised a qualitative research approach to study Malaysian Coaches' perception of the implementation of sports psychology services during athletes' daily training. The participants of the study are the five national coaches who have been working with Malaysian athletes under the National Sports Council's training programme. Participants were recruited through purposive sampling methods. Semi-structured interviews were utilised to collect data in this study, while inductive content analysis is used to analyse the data in this study. **Results:** The results found that all the coaches hold a positive attitude towards SP services. Moreover, the coaches showed a willingness to support their athletes to seek psychological services, highly agreed to allow the athletes to consult sports psychologists about personal concerns and performance-related issues. The coach mentioned that the involvement of sport psychologists in athletes' daily training more often to help athletes achieve daily goals, short-term, and long-term goals. The psychologists may act as a medium to enhance communication between coaches and players. **Conclusion:** With a greater understanding of coaches' perception towards sports psychological services, the working sports psychologists and practitioners of the sports team are able to develop and tailor intervention programs to best meet the needs of athletes' development and performance.

POSTER PRESENTATION

Effects of an Acute Kinesio Taping Intervention on Postural Control and Balance in College Volleyball Players with Chronic Ankle Instability

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Objectives: To investigate the effect of Kinesio Taping (KT) on postural control and static and dynamic balance in patients with chronic ankle instability through acute KT effect patch intervention in chronic ankle instability (CAI) college volleyball players. **Methods:** In this study, 30 college volleyball players with ankle instability underwent an acute KT effect post intervention. **Results:** After acute KT post intervention, BBS reflected a 30.9% decrease in Overall Stability Index (OSI), a 30% decrease in Anterior and Posterior Index (API), and a 29.2% decrease in Medial/Lateral Index (MLI); SOT Strategy scores, Eye-open Stability Plane scores increased by 0.2%, Eye-closed Stability Plane scores increased by 0.1%, Eye-open Swing Environment scores increased by 1.5%, open-eye swing plane score increased by 5.1%, closed-eye swing plane score increased by 5.7%, open-eye swing environment + plane score increased by 6.4%; YBT Dynamic Balance Test composite score increased by 3.7%, YBT anterior (ANT) reach distance increased by 5.8%; YBT posterolateral (PL) increased by 2.7%; YBT posteromedial (PM) reach distance increased by 4.3%; SOT Balance (Equilibrium) scores, 0.4% increase in open-eye stabilizing plane scores, 0.2% increase in closed-eye stabilizing plane scores, 3.1% increase in open-eye swing environment scores, 5.4% increase in open-eye swing plane scores, 15.3% increase in closed-eye swing plane scores, and 8.5% increase in open-eye swing environment + plane scores. **Conclusion:** Acute KT post intervention is effective in improving postural control and static and dynamic balance in college volleyball players with chronic ankle instability.

Reliability of Sensor-Based Balance System in Assessing Stability Indices in Healthy Adults

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Objectives: Postural stability, measured as overall stability index (OSI), medial-lateral stability index (MLSI) and anterior-posterior stability index (APSI), is the ability of a person to maintain the centre of gravity of the body over the base of support. The gold standard to measure stability indices is using Biodex balance system (BBS). Sensor-based balance system (SBS) is a portable balance board, with assessment software, developed and made locally to measure stability indices. It is affordable, user friendly and easy to operate. We aimed to compare SBS with BBS in assessing the stability indexes in healthy adults. **Methods:** A two-phased cross-sectional study. We recruited 26 healthy adults for phase 1 and 25 for phase 2 aged 18 to 65 years old with independent gaits and normal walking patterns. In phase 1, stability indices were measured twice; one with the SBS and the other using BBS. In phase 2, we removed the sensor of SBS and placed it on the BBS structure and compared the stability indices of both SBS and BBS in a single setting. **Results:** In phase 1, there was no correlation and agreement between SBS and BBS in measuring OSI, APSI and MLSI. Phase 2 showed good correlation scores for OSI (0.978), APSI (0.961) and MLSI (0.959) between SBS and BBS. However, Bland Altman Analysis only showed agreement for APSI but not for OSI and MLSI. **Conclusion:** SBS is not reliable in assessing stability indexes for adults. Further research and development are required to improve and upgrade the SBS.

Aerobic Exercise Improves Learning and Memory in Aging Rats by Inhibiting Brain Oxidative Stress via the KEAP1-NRF2/ARE Signalling Pathway

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Objectives: The study aimed to explore the protective effects of aerobic exercise on oxidative stress-induced cognitive impairment in D-injected aging rats via the KEAP1-NRF2/ARE pathway. **Methods:** A total of 40 6-week-old SPF-grade male SD rats were divided into 5 groups: control (C, n = 8), exercise (E, n = 8), D-injection ageing (D, n = 8), D-injection exercise (DE, n = 8), and exercise inhibition of ageing (ADE, n = 8). An experiment was conducted by administering D-injection intraperitoneally in a 1 mL/kg dose for 8 weeks to create an ageing model. The treadmill's speed was set to 1.1 km/h with an incline of 0. The exercise lasted 20–60 minutes, 6 days per week for 8 weeks. The study evaluated the effects of aerobic exercise on rat cognitive memory and the KEAP1-NRF2/ARE signalling pathway using the Morris water maze behavioural tests, Western blot analysis, and ELISA analysis, respectively. **Results:** Aerobic exercise improved Morris water maze performance, significantly reducing latency (E&C: $P < 0.05$; D&DE: $P < 0.01$). In D-injected ageing rats, exercise increased mean traverses (E&C: $P < 0.05$; D&DE: $P < 0.01$). Western Blot analysis revealed exercise enhanced NRF2 expression in the hippocampus and cortex (D&DE: $P < 0.05$) and increased KEAP1 in the cortex (D&DE: $P < 0.05$). No significant differences were observed in the ADE group compared to controls. **Conclusion:** Aerobic exercise activates the KEAP1-NRF2/ARE signalling pathway by upregulating NRF2 protein expression, enhancing superoxide dismutase activity, suppressing brain oxidative stress, and improving learning and memory in ageing rats. Future research should focus on translating the current findings to human subjects.

Cardiopulmonary Exercise Testing: A nationwide survey of current practices among sports physicians in Malaysia

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Objectives: Cardiopulmonary exercise testing (CPET) is a valuable tool for evaluating integrated cardiorespiratory function, yet its application in sports medicine varies. This study aimed to assess the perception and utilization of CPET among sports physicians in Malaysia. **Methods:** An online survey questionnaire was administered to sports physicians nationwide between December 2023 and February 2024. The survey comprised inquiries about demographics, clinical experience, current practices, and perceived utility of CPET in sports medicine. **Results:** Among 77 sports physicians contacted, 68 participated in the survey. While all respondents exhibited familiarity with the term CPET, 94.1% perceived its underutilization in Malaysia. Although 69.1% acknowledged CPET's clinical applications and benefits, only 55.9% received relevant training, primarily postgraduate academic programs in sports medicine. Despite 63.2% reported having adequate CPET, only 33.8% (23/68) offered CPET services in their hospitals. Among the 66.2% (45/68) not providing CPET services, primary barriers included limited funding and resources and insufficient knowledge and training. Other related concerns were poor awareness of its utility and personnel-time constraints among healthcare professionals. Notably, 95.7% of respondents with access to CPET agreed that it improved overall patient care, whereas 95.6% without access believed its inclusion would enhance patient care. **Conclusion:** This study provides insights into the current utilization of CPET among sports physicians in Malaysia. The findings underscore the need for enhanced education and training on CPET, alongside increased funding and awareness of its benefits. Addressing these challenges could facilitate the integration of CPET into routine clinical practice, thereby optimizing patient assessment and management strategies.

The Effects of tDCS on Performance and Muscle Synergy in the Unstable Barbell Bench Press

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Objectives: Transcranial Direct Current Stimulation (tDCS) enhances exercise capacity, yet its influence on unstable load performance remains understudied. This study aims to assess the effects of tDCS on performance and muscle coordination during the unstable barbell bench press exercise. **Methods:** Twenty-two participants underwent 1RM measurements and participated in a two-week training regimen twice a week. Subsequently, they received randomised-order tDCS interventions (true and sham). Following tDCS, participants performed the unstable bench press to exhaustion with a 60% 1RM load. Repetitions, barbell acceleration data, and sEMG signals were recorded. Integral values of triaxial acceleration versus time, muscle activation levels, agonist-antagonist co-activation ratios, and phase synchronization index (PSI) were calculated. **Results:** Endurance: tDCS did not enhance bench press repetitions under unstable conditions. Movement Stability: tDCS improved vertical stability, with significant differences observed in the first (18.03 ± 7.81 versus 25.97 ± 18.83 m/s; $P < 0.05$) and second half (17.99 ± 5.90 versus 28.92 ± 22.64 m/s; $P < 0.05$) of the exercise. Muscle Activity: tDCS increased the muscle activity of the anterior deltoid and posterior deltoid. Muscle Co-activation Level: tDCS elevated the ratio of posterior deltoid and pectoralis major co-activation in the first (0.53 ± 0.24 versus 0.44 ± 0.17 ; $P < 0.05$) and second half (0.46 ± 0.23 versus 0.37 ± 0.15 ; $P < 0.05$) of the exercise. PSI: tDCS had no notable impact on synergistic and antagonistic muscle pair coupling in alpha, beta, and gamma bands. **Conclusion:** Halo Sport's tDCS demonstrated no significant impact on endurance and muscle couplings during unstable bench press. However, it improved stability, potentially attributed to increased activation levels in the anterior deltoid, posterior deltoid, and the antagonistic co-activation ratio of the posterior deltoid and pectoralis major.

Does the Additional Inclusion of Inspiratory Muscle Training in Middle-distance Runners Enhance the Training Effect?

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Objectives: This study aims to assess the efficacy of inspiratory muscle training (IMT) in middle-distance runners, considering the device employed - PowerBreathe and Threshold. **Methods:** The study involved 25 middle-distance runners at a high level of athletic

proficiency from the AWF AZS Wroclaw sports club. Inclusion criteria included age between 18–28 years, a minimum of 5 years of training experience, and elite sport status. Participants were divided into three groups based on their IMT regimen: Group I received IMT using the PowerBreathe K-3-Series device, Group II received IMT using the Philips Respiroics Threshold device, and Group III served as the control group without additional training. Each athlete underwent spirometry, maximal inspiratory pressure (P_{Imax}), maximal expiratory pressure (PE_{max}) assessments, and physical performance evaluation using the Vyntus CPX device. The IMT programme spanned 8 weeks, with individual load calculations based on P_{Imax} measurements for each runner. **Results:** Group I exhibited a significant increase in VO₂/kg ($P = 0.01$), PEF ($P = 0.05$), P_{Imax} ($P < 0.001$), PE_{max} ($P < 0.001$), and a decrease in lactic acid levels ($P = 0.01$). Group II showed a significant increase ($P = 0.05$) in PE_{max}. **Conclusion:** Inspiratory muscle training proves effective in enhancing most spirometric parameters and respiratory muscle strength during sports training. The PowerBreathe device demonstrates greater effectiveness compared to the Threshold device. These findings suggest the inclusion of IMT using PowerBreathe in the training regimen of runners to enhance athletic performance.

Establishing 3,000 Meter Run Test Classificatory Table in Chinese Male Taekwondo Athletes

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Objectives: The 3,000-meter run is a commonly used field test for assessing aerobic fitness in Chinese taekwondo athletes, yet no definitive normative table exists for this test. This study aimed to create a classification table (using a five-point scale) for the 3,000-meter run specifically for Chinese male taekwondo athletes. **Methods:** Three hundred and seven Chinese Taekwondo black belt athletes from 34 teams nationwide were included in this study. Participants completed the 3,000-meter run test on a 400-meter outdoor running track, organised by the Chinese Taekwondo Association in Wuxi, Jiangsu Province (October 15-28, 2020). Run times in minutes and seconds were recorded. Graphpad PRISM 11 was utilised to assess normal distribution, create cumulative relative frequency graphs, and determine percentiles. **Results:** The data exhibited a normal distribution. A five-point scale was established using percentile values, categorised as follows: excellent ($\leq 5^{\text{th}}$ percentile): ≤ 634.56 s; good ($> 5^{\text{th}}$ percentile up to 25^{th} percentile): 634.56 – 652.77 s; regular ($> 25^{\text{th}}$ percentile up to 75^{th} percentile): 652.77 – 722.05 s; poor ($> 75^{\text{th}}$ percentile up to 95^{th} percentile): 722.05 – 787.12 s; and very poor ($> 95^{\text{th}}$ percentile): > 787.12 s. **Conclusion:** The classification table for the 3,000-meter run can effectively aid coaches in assessing performance and monitoring the physical fitness of Chinese male taekwondo athletes during the competitive season.

Study on Group Characteristics and Self-identity of Cycling Participants in Ho Chi Minh City-Viet Nam

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Objectives: Cycling, a physical activity with moderate to strong intensity, offers various health benefits. Despite this, research on cycling in Vietnam is limited. With the increasing number of cyclists, understanding the group characteristics and self-identity of participants and exploring their correlation is essential. **Methods:** This study investigated 321 non-athlete cyclists in Ho Chi Minh City, Vietnam, using interviews, logical data analysis, and statistical analysis. Rhona Ochse & Cornelis Plug's self-report questionnaire (1986) was utilised, covering demographic variables, cycling behaviours (duration, frequency, purpose, organisation pattern, etc.), and self-identity. Data were analysed using SPSS version 26.0. **Results:** Self-identity scores fell within the normal range (56–58). A significant proportion (35.1%) cycled for 1–2 hours per week. Most participants cycled randomly throughout the week for recreation and health. Among cycling behaviour variables, organisation pattern demonstrated a significant correlation with self-identity ($P < 0.050$). **Conclusion:** These findings underscore the relationship between group characteristics, particularly organisation pattern, and self-identity among cycling participants in Ho Chi Minh City, Vietnam. Further research is vital for resource provision and risk management in cycling.

Impact of Contrast Training on Countermovement Jump Performance and Lower Body Strength in Malaysia's National Silat Athletes

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Objectives: This study aims to investigate the impact of an 8-week contrast training on CMJ performance and lower body strength in Malaysia's national Silat athletes. **Methods:** Eighteen Malaysian National Silat athletes (13 male, 5 female) participated in this study. Pre- and post-tests of CMJ were conducted using force platforms (Hawkin Dynamics), while lower body strength was quantified by estimating the one-repetition maximum (e1RM) using a Velocity-Based Training device (GymAware). Data were analysed through a paired sample t-test using SPSS version 16. **Results:** The study revealed significant improvements in lower body strength and CMJ performance following the 8-week contrast training. Athletes demonstrated notable increases in e1RM ($P = 0.005$), indicating enhanced lower body strength. Furthermore, significant improvements were observed in CMJ performance, evidenced by increases in jump height ($P = 0.001$) and peak power ($P = 0.007$), highlighting the efficacy of the 8-week contrast training in enhancing lower body strength and power in athletes. **Conclusion:** This study suggests that 8 weeks of contrast training positively influences CMJ performance and lower body strength among Malaysia's National Silat athletes. These findings underscore the potential of tailored contrast training to enhance the explosive power required for Silat performance, with implications for both male and female athletes.

Anthropometry Characteristics of Malaysian Junior Male Badminton Players

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Objectives: Anthropometry serves as a common talent indicator, enhancing the understanding of potential performance capabilities and aiding in predicting future success in badminton. This study aimed to profile the anthropometry of Malaysian sub-elite male junior badminton players. **Methods:** Twenty-one full-time badminton players (mean age: 14.8 ± 1.5 years) were recruited from national sports schools and professional clubs. Anthropometric measurements included body height, mass, and 7-site skinfold thickness.

Body fat percentage was calculated using established formulas. **Results:** The results, reported as mean \pm standard deviation, revealed the following: weight: 57.26 ± 8.89 kg; height: 167.94 ± 7.35 cm; BMI: 20.22 ± 2.33 kg/m²; fat percentage: $9.84 \pm 3.92\%$. The average height of Malaysian junior male players was relatively lower compared to international junior elite players from Indonesia, Iceland, Spain, and Belgium, with smaller BMI and lower body fat percentage (mean: 174.03 ± 21.4 cm, 11.77%). A test battery conducted in Belgium showed that junior male badminton elites had a taller and more muscular physique compared to novice players. However, anthropometric variables contributed relatively little to skill level (height 2%, muscle mass 4%), suggesting that other components such as strength and repeated-sprint ability could be more significant performance indicators for senior elites in France. **Conclusion:** Ideally, a taller physique offers players greater potential for attacking and executing more downward strokes. A leaner, more muscular physique with lower adiposity would aid players in sustaining themselves throughout high-intensity, fast-paced badminton matches. The anthropometric findings in this study contribute to the limited reference values available for junior badminton players.

The Immediate Effect of Thoracic Manipulation on the Shoulder Range of Motion and Swimming Performance in Competitive Swimmers

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Objectives: Swimmers aim to cover distance with optimal shoulder range of motion (ROM) and maximum speed in the shortest time possible. It is hypothesised that optimal shoulder ROM may enhance swimming performance. This study aims to investigate the biomechanical relationship between the thoracic spine and shoulder joint before and after chiropractic intervention, aiming to determine the effect of thoracic spine manipulation on shoulder ROM and 50m freestyle performance. **Methods:** A randomised controlled clinical pilot trial was conducted at Ikan Bilis Swimming Club involving 28 male competitive swimmers aged 13 to 20. Swimmers were randomly assigned to either the control or intervention group. Shoulder ROM was measured pre- and post-intervention in both groups using a goniometer. The timing for the pre- and post-50 m freestyle sprint was recorded in both groups using a handheld digital stopwatch. **Results:** A significant correlation was observed between thoracic manipulation and shoulder abduction ROM. However, there was no significant change in 50 m freestyle swimming velocity post-thoracic manipulation. **Conclusion:** Thoracic manipulation immediately affects shoulder abduction ROM, but does not have an immediate impact on swimming performance. Various limitations, including the complex use of the upper limb, scapulothoracic joint, and cervico-thoracic spine during swimming, along with the surrounding musculature, may contribute to the lack of improvement in performance following a single manipulative intervention. Further extensive research is warranted.

Some Key Medical Issues Addressed in Sports Medicine

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Objectives: This study aims to summarise key medical issues addressed in sports medicine, emphasising the importance of interdisciplinary collaboration in optimising athlete health and performance. **Methods:** A comprehensive review of literature and expert consensus guidelines was conducted to identify key medical issues in sports medicine. Peer-reviewed research articles, review papers, and reports from relevant sports medicine organisations and academic institutions were examined. Key databases such as PubMed and Google Scholar were searched using relevant keywords. Data were synthesised to provide an overview of prevalent and impactful medical issues in sports medicine. **Results:** Key medical issues in sports medicine include musculoskeletal injuries, concussions, overuse injuries, cardiovascular health, nutrition and hydration, exercise-induced asthma, heat-related illnesses, injury prevention, rehabilitation, and psychological well-being. Sports medicine professionals, including physicians, physical therapists, athletic trainers, and nutritionists, play a critical role in diagnosing, treating, and preventing these issues through a multidisciplinary approach. **Conclusion:** Sports medicine addresses a broad spectrum of medical issues related to physical activity and sports participation, necessitating expertise across various disciplines for effective management. By focusing on prevention, diagnosis, treatment, and rehabilitation, sports medicine professionals aim to optimise athlete health and performance while prioritising safety and well-being. Continued research and collaboration are vital for advancing understanding and improving care for athletes and physically active individuals.

Hyalofast Overgrowth Following Cartilage Repair: A case series

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Objectives: In recent years, autologous matrix-induced chondrogenesis (AMIC) procedures such as Hyalofast have gained popularity due to favourable clinical outcomes. **Methods:** This case series presents a rare delayed complication of cartilage overgrowth following Hyalofast procedures conducted at the Arthroscopy and Sports Injury Unit (ASIU), Orthopaedic Department, Hospital Kuala Lumpur. Follow-up was conducted until treatment and resolution of symptoms. **Results:** Two cases of cartilage overgrowth are reported, involving a 53-year-old male patient and a 42-year-old female patient, both of whom underwent Hyalofast procedures for cartilage defects. Despite standardised Hyalofast procedures and rehabilitation protocols, both patients developed symptoms at 8- and 4-months post-procedure, respectively. Diagnosis was confirmed clinically with bedside ultrasound for the first patient and MRI for the second. Arthroscopic debridement of cartilage overgrowth resulted in immediate symptom resolution in both cases, with sustained improvement at 5 weeks post-debridement for the second patient. **Conclusion:** Clinicians should be vigilant regarding Hyalofast overgrowth as a potential complication presenting several months post-procedure. Symptoms may include recurrent or worsening pain, a catching sensation during knee range of motion, or limitations in daily activities despite adherence to rehabilitation protocols. Arthroscopic debridement has shown favourable clinical outcomes in managing this complication.

Preliminary Investigation on the Incidence of EID in Athletes: A report of Chengdu Sport University

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Objectives: This study aimed to investigate the symptoms of exercise-induced dyspnoea (EID) in athletes from Chengdu Sport University via questionnaire and explore associated factors. **Methods:** Drawing on questionnaire items from domestic and international sources, key indices including the induction, remission, and alleviation of EID symptoms were analysed. Exposure and protective factors were identified, and a unified "Questionnaire on Athletic Dyspnoea Symptoms in Athletes" was devised. Athletes from various sporting disciplines at our university were surveyed via online platforms and telephone, with retrospective analysis conducted in conjunction with medical records. **Results:** Following reliability testing, exposure and remission factors of EID were analysed and determined. BMI ($P = 0.015$), gender ($P = 0.001$), RPE ($P = 0.004$), allergy ($P = 0.028$), rhinitis ($P < 0.001$), season ($P = 0.006$), and humidity ($P = 0.015$) were identified as significant factors influencing the onset of EID. However, asthma ($P = 0.999$) and smoking ($P = 0.392$) showed no statistical significance regarding EID occurrence. The discrepancy in confirmed EID cases due to remission factors ($P < 0.05$) was statistically significant. **Conclusion:** BMI, gender, RPE, allergy, rhinitis, season, and humidity are associated with EID, while asthma and smoking lack direct correlation with its occurrence. Implementing adequate warm-up activities and adjusting breathing patterns during exercise may help reduce the incidence of EID.

Implementing PUTRAWEFITM Clinic in Primary Care: Challenges and lessons learned

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Objectives: Primary care-led physical activity interventions enhance the adoption of regular exercise. The PutraWEfitTM (Putra Weight Management and Exercise for Fitness) clinic was established in 2019 at the Family Medicine Specialist Clinic, Hospital Sultan Abdul Aziz Shah, UPM. This clinic aims to empower clients to initiate or enhance exercise behaviour for a healthier lifestyle. Eligible clients are ≥ 18 years old, irrespective of weight, with readiness to change, at least at the contemplation stage. A clinical audit was conducted to assess the quality of care provided. **Methods:** Audit of the process and outcomes was carried out from January 2021 to December 2022, assessing changes in muscle mass, body fat, 6-minute walk distance, and motivations and challenges to care. **Results:** A total of 138 clients were enrolled in the clinic, with ages ranging from 18 to 76 years, the majority being women (66.7%) and of Malay ethnicity (61.6%). Mean muscle mass (baseline: 22.8 kg; 3-month: 29.5 kg), body fat (baseline: 40.7%; 3-month: 39.7%), and 6-minute walk distance (baseline: 375.5 m; 3-month: 487.6 m) showed trends of improvement. Motivation stemmed from the multidisciplinary team approach at each visit. Challenges included long waiting times for appointments and peer support group sessions. Staff encountered difficulties in coping with assessments and a limited number of exercise prescribers. **Conclusion:** Based on these findings, the clinic plans to train more paramedics for concurrent assessments and expand clinic slots with additional family physicians. Focused topics for peer support group sessions are being implemented, and clients have the option for a monthly supervised exercise session with the sports academy team. Improving the quality of care through training is planned, with a workshop aimed at empowering healthcare providers in weight management.

Comparison of Knee Anatomical Characteristics Associated with Anterior Cruciate Ligament Injury between Chinese Females and Males

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Objectives: Anterior cruciate ligament (ACL) injury occurs more frequently in females than males in many sports, with the gender disparity attributed to various factors, including differences in knee anatomy. This study aims to compare knee anatomical characteristics associated with ACL injury between Chinese females and males. **Methods:** Knee anatomical characteristics were measured using 3T magnetic resonance imaging (MRI) in 100 healthy subjects, comprising 50 women and 50 men. Knee geometry related to ACL injury, identified in previous analyses, was assessed, including medial and lateral posterior tibial slope (PTS), medial and lateral meniscus slope angle (MSA), medial and lateral meniscal-bone angle (MBA), notch width index (NWI), and the height of the medial and lateral tibial spine. The anatomical features of the ACL were analysed by calculating the signal-to-noise quotient (SNQ) of the ACL. **Results:** Female subjects exhibited significantly greater medial PTS, greater medial MSA, and lower height of the medial and lateral tibial spine compared to males ($P < 0.05$). **Conclusion:** In the healthy population, Chinese females displayed anatomical risk factors for ACL injury, including greater medial PTS, greater medial MSA, and lower height of the medial and lateral tibial spine, in comparison to Chinese males. Differences were also observed in ACL MRI signal intensity between Chinese females and males, indicating distinct structural characteristics of the ACL.

Medial Ankle Sprain Injury in Pencak Silat: Mechanism and risk factors

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Objectives: Pencak Silat's global popularity has led to increased interest but also to a rise in associated injuries. Medial ankle sprains, constituting 10-15% of all ankle sprains, are less common. This study aims to explore the mechanism and risk factors of medial ankle sprains occurring in young Pencak Silat athletes during training. **Methods:** A 15-year-old Indonesian Pencak Silat athlete experienced medial ankle pain during a training session. Concerns arose regarding performance in a national tournament scheduled within 3 weeks due to decreased range of motion, strength, balance, and postural control. The patient received treatment at the National Sports Hospital by a Sports Medicine Physician and Rehabilitation team. **Results:** The patient successfully regained range of motion, strength, balance,

postural control, and specific movements for Pencak Silat combat categories. Additionally, no complaints or injuries were reported after the tournament. **Conclusion:** Eversion related to direct opponent contact was identified as the source of external force straining the deltoid ligament. Risk factors for this injury included the application of new rules in Pencak Silat allowing athletes to perform the Tarikan technique and inadequate mastery of the technique.

Bilayer MOF Electrospun Membrane Promotes Tendon-Bone Enthesis Healing

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Objectives: The tendon-bone entesis is a challenging gradient tissue to repair. Leveraging the regenerative potential of various metal-organic frameworks (MOFs), this study utilised polylactic acid (PLA) bio-fibre membrane to construct a bilayer fibrous membrane (PLA-H/Z) with ZIF-11 and HKUST-1 nanoparticles in the upper and lower layers, aiming to mimic the natural features of the entesis for synchronous and complete regeneration. **Methods:** The double-layer MOFs fibrous membrane was fabricated through continuous electrospinning. The biocompatibility and repair capacity of the fibrous membrane were assessed via in vitro experiments. In vivo evaluation of the regeneration effect of the electrospinning fibre membrane was conducted using a rat rotator cuff injury model, with biological function and histomorphological analyses performed postoperatively. **Results:** The scaffold exhibited excellent carrying and controlled release capabilities. Results from living/dead and CCK8 experiments demonstrated good cytocompatibility of the fibrous membrane. In vitro experiments revealed that the HKUST-1 layer could enhance calcium deposition and ALP activity in osteoblasts, and up-regulate the expression of osteoblast-related genes ALP and Runx2. Moreover, HKUST-1 promoted the angiogenesis process in HUVECs. Meanwhile, the ZIF-11 layer could enhance the secretion of tenogenesis proteins SCX and Col1. In the *in vivo* experiment, the double-layer fibrous membrane facilitated postoperative bone regeneration at the insertion site, with histopathological results further confirming improved cell morphology distribution and fibrous alignment in the entesis in the PLA-H/Z group. **Conclusion:** This study presents a novel approach for repairing the tendon-bone interface clinically using an electrospun fibre scaffold.

The Relationship of Compliance in the Friday Run Program with the Physical Fitness of Junior High School Students in Central Jakarta: A longitudinal observational study

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Objectives: In an era of rapid technological advancement, declining physical activity rates can adversely affect students' health, cognition, and psychology, impacting overall quality of life. It is imperative for Indonesian school authorities to recognise the importance of structured physical activity programmes in enhancing students' fitness levels, which can lead to a re-evaluation of academic programmes to strengthen students' cognitive, academic, and social abilities. This study aims to determine the relationship between compliance with the Friday Run training programme and the physical fitness of junior high school students in Central Jakarta. **Methods:** The study focuses on a school implementing a structured physical activity programme called "Friday Run," where students are required to run approximately 2 km weekly before class. Observations were conducted over nine weeks, with physical fitness assessed in the 10th week using the bleep test. VO_2 max serves as a predictive indicator of physical fitness level, assessed in 30 randomly sampled students. **Results:** 83% of students demonstrated good compliance with the programme. The average predictive value of VO_2 max measured through the bleep test is 25.95 (4.35) ml/kg/minute, with a minimum of 20.04 ml/kg/minute and a maximum of 35 ml/kg/minute. Schools serve as ideal environments to promote physical activity, effectively increasing students' physical activity levels while at school and improving their physical fitness. **Conclusion:** Participation in the "Friday Run" programme for nine weeks did not correlate with students' VO_2 max levels. Interestingly, student council administrators demonstrated better predictive accuracy of VO_2 max values and physical fitness levels compared to non-student council administrators.

Spinal Curvature Abnormalities as a Risk Factor of Injury in Runners: Scoping review

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Objectives: Spinal curvature abnormalities may alter weight distribution during physical activity, potentially increasing the risk of musculoskeletal injuries. Given the prevalence of running, its impact on individuals with these disorders requires thorough investigation. This study aims to assess the effect of running on musculoskeletal injury risk in individuals with spinal curvature disorders. **Methods:** In October 2023, we conducted a literature search across MEDLINE, EMBASE, SCOPUS, and Google Scholar. Included studies focused on individuals with spinal curvature disorders engaged in running, with musculoskeletal injury as a variable. Exclusion criteria were non-English or non-Bahasa studies and those lacking full-text availability. Eligible studies included systematic reviews, cohort studies, and case-control prognostic studies. Two reviewers assessed the journals using critical appraisal tools from CEBM Oxford University. **Results:** Of 264 initially identified studies, 98 duplicates were removed, leaving 166 for screening. Five studies met the inclusion criteria: one systematic review, one meta-analysis, two cohort studies, and one case-control study. Scoliosis was the most common spinal abnormality examined. Participants included typical adolescents, adolescents with scoliosis, male soccer players, and runners. Interventions involved various physical activities, with outcomes focused on condition progression, injury occurrence, or recommendations for patients with spinal curvature disorders. **Conclusion:** Patients with scoliosis do not have an increased risk of musculoskeletal injury compared to the general population engaged in running. Recommendations include encouraging regular physical activity, using appropriate sports equipment for each activity, and undergoing an initial examination if no prior clinical diagnosis has been performed.

The Effectiveness of Cardiorespiratory Exercise Program to Improve Erectile Function and Quality in Erectile Dysfunction Patients: A scoping review

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Objectives: Erectile dysfunction (ED) is characterised by the inability to achieve and maintain an erection sufficient for satisfactory sexual performance. Globally, ED cases are projected to reach 322 million by 2025, with a current prevalence of 35.6% among Indonesian men aged 30–80 years. This study evaluates the effectiveness of cardiorespiratory exercise as a non-pharmacological treatment for ED.

Methods: A comprehensive search was conducted across PubMed, Embase, and Scopus databases, supplemented by manual searches of relevant literature using targeted keywords. Inclusion criteria encompassed studies published in the past ten years, available in full text, involving participants with International Index of Erectile Function (IIEF-5) scores below 21, utilising cardiorespiratory exercise either as a sole or combined therapy, written in English or Bahasa, and exclusively focused on human subjects. Titles and abstracts were screened, followed by a detailed analysis of the literature meeting these criteria. **Results:** From an initial search yielding 61 records, 24 duplicates were removed, leaving 37 for screening. Six studies met the inclusion criteria, comprising 5 randomised controlled trials (RCTs) and one systematic review. Five studies involved ED patients with comorbidities. One RCT examined the impact of cardiorespiratory exercise combined with pharmacological intervention, two RCTs investigated exercise combined with dietary intervention, and three RCTs compared exercise groups with non-exercise groups. Additionally, one RCT assessed the comparative effects of different exercise volumes on ED patients. **Conclusion:** Cardiorespiratory exercise, employed as a non-pharmacological approach, is safe and effective in improving erectile function in patients diagnosed with ED. The studies reviewed utilised various cardiorespiratory exercise regimens.

How Safe is Running for Obese Adults: A scoping review

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Objectives: Southeast Asia faces a significant obesity challenge, where physical inactivity plays a key role. Running is more effective than walking for weight loss in obese individuals. However, novice runners have twice the risk of running-related injuries (RRI) compared to experienced runners, raising safety concerns for obese individuals engaging in running. This study aims to identify predictive factors that increase the risk of RRI. **Methods:** This study employed the PRISMA methodology across six databases (PubMed, Embase, Cochrane, Scopus, EBSCO, and Epistemonikos) along with hand-searching, conducted from 1st to 4th May 2023. Keywords included "novice runners," "obesity," "body mass index," and "injury." Eligibility criteria encompassed studies published in English within the past ten years, focusing on prognostic research discussing musculoskeletal injury risk in novice obese runners or examining body mass index (BMI) as a risk factor for musculoskeletal injury in runners. **Results:** Of 85 publications, four prospective cohort studies met the eligibility criteria. Several factors contribute to the increased risk of RRI. Analysis revealed that higher BMI (HR 1.04; RR 1.25), older age (HR 1.02; RR 1.38), history of non-RRI (HR 1.78; RR 1.65), competitive behaviour (RR 0.8), lack of running experience (HR 2.38), and running more than 3 kilometres in the first week (RR 7.33) are predictive factors for RRI in novice obese adult runners. **Conclusion:** Running can be a safe physical activity for individuals with obesity, but specific factors need careful consideration before starting a training programme to prevent RRI.

COVID-19 Infection and the Time Taken to Return-To-Play Among Elite Competitive Athletes in Japan, 2022-2023

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Objectives: To report the incidence of COVID-19 infection and the time to return-to-play (RTP) among elite Japanese athletes.

Methods: This retrospective records review involved athletes who underwent medical check-ups at the Japan Institute of Sports Sciences (JISS) between June 2022 and May 2023. Primary outcomes included the number of COVID-19 infections and RTP times based on interview data. Factors influencing prolonged RTP (28 days or more) were assessed using simple logistic regression.

Results: Of the 1,270 athletes who underwent medical check-ups at JISS, 464 (36.5%) had a history of COVID-19. The mean age of infected athletes was 23.3 (4.6) years. The majority were male (56%), badminton players (16%), and summer sports athletes (78%). Fever was the most common symptom (76%), followed by sore throat (56%) and cough (43%). Overall, 12% returned to play without symptoms. The median (interquartile range) RTP was 10 (7–14) days, with prolonged RTP observed in 26 (5.6%) athletes. Univariate regression analysis identified significant associations of prolonged RTP with cough (odds ratio [OR] 2.83, 95% confidence interval [CI] 1.11–7.21), fatigue (OR 3.34, 95% CI 1.35–8.25), and joint pain (OR 3.98, 95% CI 1.57–10.10). **Conclusion:** This study detailed the incidence of COVID-19 infection and RTP times among elite Japanese athletes. The median RTP of 10 days was shorter than the 18 days reported for UK athletes in a previous study. Prolonged RTP may be associated with specific symptoms.

Study of the Biomechanics of the Single-Leg Landing Movement as a Risk Factor for Knee Injuries in Adult Women: Scoping review

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Objectives: Obesity contributes to anterior cruciate ligament (ACL) rupture during "single-leg landing" exercises in muscle strengthening programmes. Single-leg landing, a unilateral movement, requires coordinated muscle action for effective kinetic energy absorption. This study aims to analyse the biomechanics of single-leg landing. **Methods:** Clinical questions were framed within the PICO framework ("female," "single-leg landing," "risk factor," and "knee injury"). The PRISMA flowchart guided structured keyword searches in online databases (PubMed, Embase, and Cochrane) and hand-searching to locate prognostic studies. **Results:** Five selected studies highlight the significance of Dynamic Knee Valgus (DKV) as a risk factor for ACL injury during single-leg landing movements. One randomised

controlled trial (RCT) underscores the importance of controlling knee valgus to prevent knee injuries. A case-control study suggests that modifying ankle movement strategies during landing can reduce the knee valgus angle, a known risk factor for ACL injury. Furthermore, a case-control study and a cohort study indicate that increased hip muscle strength in women leads to decreased knee valgus angle. Finally, a laboratory-controlled study suggests that optimising neuromuscular control during the preparation phase of single-leg landing may mitigate ACL injury risk. **Conclusion:** Single-leg landing activities increase the risk of knee injuries in women, primarily ACL tears, due to greater Dynamic Knee Valgus (DKV) compared to men. This higher knee valgus angle in women during dynamic movements is linked to inadequate neuromuscular control, involving the antagonist muscles of the legs, hips, ankles, and trunk.

Pattern of Injury and Illness in Balik Pulau Rugby 10s Tournament 2023

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Objectives: Rugby 10s is a variant of rugby union with teams comprising ten players (five forwards and five backs) and matches played in two ten-minute halves. Despite the shorter game duration, injury risks persist. This study presents the pattern of injury and illness observed during a Rugby 10s tournament in Malaysia. **Methods:** This prospective observational study was conducted during the Rugby 10s tournament at Politeknik Balik Pulau, Penang, Malaysia, from 24th to 25th June 2023. Forty-four teams participated, including 24 men's teams, 10 women's teams, and 10 polytechnic teams, resulting in a total of 119 matches over two days. Injuries and illnesses were recorded by the attending medical team using a standardised medical record. **Results:** Sixty injury cases were recorded during the tournament. The most frequently injured body parts were the upper limbs, followed by the head and face. Most injuries were musculotendinous sprains or strains. Forwards had a higher incidence of injury compared to backs. **Conclusion:** The incidence of injury was consistent with other Rugby 10s tournaments. Poor conditioning and technique contributed to these injuries. Comprehensive injury data and statistics are essential for developing injury prevention programmes and planning future rugby matches and tournaments.

Exploring How Age, Gender, Type of Sport and Various Health-Related Fitness Parameters Correlate with VO₂ max in Adolescent Athletes: A cross-sectional study

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Objectives: Intensive training enhances the body's oxygen supply and muscle utilization, thereby increasing VO₂ max. However, other factors also influence VO₂ max. This study examines the impact of age, gender, sports participation, and health-related fitness parameters (including body composition, upper muscular strength, and flexibility) on VO₂ max in national-level adolescent athletes at the Cibubur Youth Athlete Training Center (CYATC). **Methods:** This study included all CYATC student-athletes aged 10–18, with data collected from October 24th to December 18th, 2023. Physical fitness parameters measured included height (via stadiometer), cardiorespiratory fitness (20 m shuttle run), upper muscular strength (handgrip test), flexibility (sit and reach), and body composition (Bioelectrical Impedance Analysis). Univariate, bivariate, and multivariate analyses were performed. **Results:** Out of 81 CYATC student-athletes, 63 participated. Pearson correlation tests showed significant associations between VO₂ max and age ($P = 0.001$; $r = 0.420$), height ($P < 0.001$; $r = 0.603$), body weight ($P < 0.001$; $r = 0.502$), %SMM ($P < 0.001$; $r = 0.609$), %TBF ($P < 0.001$; $r = -0.500$), upper muscular strength ($P < 0.001$; $r = 0.486$), gender ($P < 0.001$), and type of sport ($P < 0.001$). Multiple linear regression indicated that age and %SMM together predicted VO₂ max by 50.5%. **Conclusion:** Age and skeletal muscle mass are significant predictors of VO₂ max. Training for adolescent athletes should consider these factors to optimise physical performance.

Data Treatment of Hip Coxarthrosis with Therapy Based on High Molecular Weight Cross-Linked and Intercalated Hyaluronic Acid

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Objectives: This study introduces a new therapeutic protocol involving an ultrasound-guided 'one-shot' infiltration of cross-linked hyaluronic acid (HA) for treating 1st and 2nd degree coxarthrosis of the hip. The approach combines viscosupplementation (volume) and viscoinduction (repair) in a concept known as Biorivolumentria. **Methods:** Ten professional athletes (six males and four females, aged 20–40 years) with radiological or MRI-confirmed 1st or 2nd degree coxarthrosis of the hip and clinical symptoms in the hip or inguinal region were included. None were on medication or physiotherapy, and none showed clinical symptoms of arthritic or infectious hip disease. Follow-up concluded 90 days post-infiltration, with monthly assessments using the Harris Hip Score. Treatment involved ultrasound-guided infiltration with cross-linked HA of high molecular weight (1+2 million K Dalton), intercalated with a low molecular weight free fraction (500k Dalton). **Results:** Significant improvement was observed in the clinical symptoms and joint function, with a marked reduction in the Harris Hip Score. At 15 days post-infiltration, a 50% reduction in the HIP score was noted, increasing to 80% at 90 days. **Conclusion:** The findings suggest the potential of this Biorivolumentria-based method to prevent and halt the progression of 1st and 2nd degree osteoarthritic lesions of the hip. Further research with a larger patient cohort is warranted.

Assessment Features of Moderate to Vigorous Physical Activity Engagement Among Indonesian School-Aged Children: A cross-sectional observational study

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Objectives: Global guidelines recommend that children engage in at least 60 minutes of moderate to vigorous physical activity (MVPA) daily to improve health outcomes and reduce the risk of obesity and diabetes, while also benefiting bone and mental health. This study aims to assess MVPA engagement among Indonesian school-aged children and examine differences between rural and urban settings. **Methods:** Data were sourced from the South-East Asian Nutrition Survey II (SEANUTS II) Indonesia in 2019. Physical activity was assessed using accelerometers (GeneActiv, Activinsights Limited, UK) worn on the non-dominant wrist for seven consecutive days by

school-aged children (aged 7–12 years) across 19 areas in Indonesia. **Results:** Of the 872 children (410 boys, 462 girls), 52.5% resided in urban areas, with 71.8% meeting the recommended 60 minutes per day of MVPA. The average engagement in MVPA was 80.14 (48.43) minutes per day, with light physical activity (LPA) averaging 257.25 (45.22) minutes per day, and sedentary behaviour averaging 594.80 (84.18) minutes per day. The total daily average physical activity was 72.68 (28.73) milligravity. The Mann-Whitney test revealed no significant difference in MVPA duration between urban and rural children ($P = 0.21$), while boys were more active in MVPA compared to girls ($P < 0.01$). **Conclusion:** The findings indicate that 71.8% of Indonesian school-aged children are sufficiently active in MVPA. Further analysis is required to explore additional factors influencing physical activity engagement among these children.

Epidemiological of Sports-Related Injuries in Amateur Basketball Enthusiasts Among High School Students in Malaysia

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Objectives: This study investigates the epidemiology of sports-related injuries among amateur basketball enthusiasts aged 16 to 18, focusing on Chinese Independent high school students in Johor, Malaysia. **Methods:** The study involved 172 high school basketball players and 153 enthusiasts who participated in injury surveillance via online surveys for data collection and analysis. **Results:** The findings indicate that males comprised the majority of sports injuries, including abrasions, contusions, muscle strains, and sprains. Basketball players experienced injuries both in practice and competition, with the knee joint most frequently affected. In contrast, enthusiasts primarily sustained injuries during competition, predominantly affecting the ankle joint. Subjective and objective factors contributing to injuries included excessive excitability during exercise, insufficient preparation or relaxation activities, unexpected emergencies, lack of attention to safety precautions, and inadequate facilities. Physiological and technical factors varied between players and enthusiasts. Players mainly experienced injuries due to pre-existing conditions, opponent fouls, or physical collisions, while enthusiasts were more prone to injuries from physical fatigue and improper techniques. Both groups primarily obtained sports injury-related information from basketball coaches and teachers, with traditional Chinese medicine practitioners being the main professionals sought for post-injury treatment. Treatment methods varied, with players predominantly opting for ice compresses, while enthusiasts preferred massage. **Conclusion:** A tailored sports injury prevention plan is recommended to reduce the occurrence of injuries based on the specific characteristics of different groups of high school students.

Two-Way Two-Sample Mendelian Randomisation Study on the Causal Relationship between Type II Diabetes Mellitus and Coronary Heart Disease

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Objectives: This study aims to investigate the bidirectional causal relationship between type II diabetes mellitus (T2DM) and coronary heart disease (CHD). **Methods:** Single nucleotide polymorphism (SNP) loci strongly associated with T2DM and CHD were collected from extensive genome-wide association studies (GWAS) as instrumental variables. Mendelian randomization (MR) estimation employed the inverse variance weighting (IVW) method, the weighted median method, and the MR-Egger method. Sensitivity analyses included Cochran's Q test, MR-Egger intercept test, MR-PRESSO, MR Steiger test, leave-one-out analysis, and funnel plot. **Results:** Screening yielded a total of SNPs associated with T2DM. IVW analysis indicated a causal relationship between T2DM and CHD (odds ratio [OR] = 1.003, 95% confidence interval [CI]: 1.002–1.004, $P < 0.001$). Cochran's Q test showed $Q = 424.0453$; $P = 3.876996e-11$, suggesting no heterogeneity among the included SNPs. The MR-Egger intercept was ($P = 0.1942554$), indicating no genetic pleiotropy in the screened SNPs. MR-PRESSO detected no outlier SNPs. Leave-one-out sensitivity analysis showed no significant impact of specific SNP effects on causal estimation. Inverse MR analysis corroborated IVW findings (OR = 1.156, 95%CI: 0.012–106.293; $P = 0.94983104$), with Cochran's Q test showing $Q = 57.72660$; $P = 1.298917e-09$, and an MR-Egger intercept of ($P = 0.5176637$), indicating lack of support for reverse causality between T2DM and CHD. **Conclusion:** This MR study confirms a causal association of T2DM with CHD, while findings do not support reverse causality. This contributes to our understanding of the mechanisms underlying T2DM's effect on CHD.

Physical Activity Level among Young Medical Students in Semarang Indonesia

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Objectives: Physical activity level (PAL) correlates with cardiorespiratory fitness and cognitive performance, making it crucial for young medical students to enhance their PAL. Thus, our aim is to describe PAL among young medical students, assess whether they meet physical activity recommendations, and explore methods for improvement. **Methods:** This cross-sectional, descriptive study employed the International Physical Activity Questionnaire - Short Form (IPAQ-SF) to measure PAL. Data were collected in December 2023 from medical students, including co-assistants, young doctors, and residents aged 18–35 years, excluding those with diabetes mellitus, hypertension, heart disease, pulmonary disease, or neuromusculoskeletal problems. Subsequently, we conducted a follow-up survey to evaluate the results. **Results:** The study included 55 male medical students, with an average age of 27.45 ± 4.99 years. Physical activity categories were as follows: 49.09% low (27 students), 29.09% moderate (16 students), and only 21.81% high (12 students). Survey responses revealed that 92% of students cited lack of time as a barrier to exercise, while 28% mentioned a shortage of sports facilities. Additionally, 72% expressed a desire for the hospital or faculty to provide sports facilities, and 60% suggested organising events for group exercise. **Conclusion:** Nearly half of the medical students exhibited low levels of physical activity. The majority cited lack of time as a primary barrier to exercise. It is imperative for the hospital or faculty to provide sports facilities and schedule exercise sessions. Although this study had a small sample size, further research is warranted to confirm medical students' PAL and implement strategies for improvement.

Physical Activity Attenuates Negative Effects of Short-Term Exposure to Moderate Air Pollution Levels on Cardio-Respiratory Responses

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Objectives: Air pollution poses a significant environmental concern impacting human health and health-related behaviour. Physical activity (PA) is widely acknowledged as a means to promote health and well-being and may be affected by air pollution. However, there is limited research on the extent to which engaging in PA in polluted environments could mitigate the adverse effects of air pollution. Therefore, we aimed to assess the impact of PA on cardio-respiratory responses during short-term exposure to varying levels of air pollution among healthy young adults. **Methods:** We conducted a real-world crossover study involving 26 healthy young adults. Participants engaged in 90 minutes of moderate-intensity PA under different pollution exposure conditions, including low, moderate, and high pollution levels. Cardiorespiratory measurements and blood samples were collected before and after the intervention. Linear mixed models were employed to analyse the effects of the intervention programme. **Results:** All 26 participants (12 female, 14 male, mean age 20.1 ± 0.9 years, mean body mass index 23.0 ± 1.9) completed the study. The mixed linear model analysis revealed a statistically significant increase in diastolic blood pressure (6.5%, $P = 0.05$) and fractionated exhaled nitric oxide (FeNO) levels (13.3%, $P < 0.001$) at high levels of air pollution compared to low and moderate pollution exposure scenarios. **Conclusion:** Engaging in PA in environments with low and moderate air pollution levels appears to be a preventive measure for mitigating adverse cardio-respiratory effects.

Whether the Use of IMT Training Together with Cardiac Rehabilitation will Enhance the Training Effect in HF Patients with Low Left Ventricular Ejection Fraction

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Objectives: This study aimed to assess the impact of adding a 4-week inspiratory muscle training (IMT) programme to standard cardiac rehabilitation in heart failure patients with low ejection fraction on respiratory function, physical performance, and blood biochemistry. **Methods:** Twenty-eight patients (mean age 69 years) with heart failure and low ejection fraction were included in the study. Patients were randomly assigned to two groups: 13 patients in the inspiratory muscle training (IMT) group and 16 patients in the sham-IMT group. Assessments of maximum inspiratory and expiratory pressure, as well as spirometric tests, were conducted twice before IMT and after 4 weeks. Parameters measured included P_{Imax}, P_{E_{max}}, VO₂ peak, blood pressure (BP), heart rate (HR), metabolic equivalent (MET), minute ventilation (VE), C-reactive protein (CRP), pro-brain natriuretic peptide (proBNP), cholesterol, and triglycerides (TG). IMT intensity was individually determined based on P_{Imax}, with training sessions conducted seven times a week (21 minutes per day; seven cycles of 2 minutes with 1 minute rest between each cycle), starting at 30% and progressing to 60% of P_{Imax}. The control group underwent a sham inspiratory muscle training placebo procedure. **Results:** Group I (IMT) exhibited highly significant increases in muscle strength, peak VO₂, and MET. Group II (sham-IMT) showed significant changes in peak VO₂ and MET. Comparative analysis revealed significantly higher inspiratory muscle strength, peak VO₂, and MET values in Group I patients. **Conclusion:** Integrating IMT into cardiac rehabilitation for patients with heart failure led to significant improvements in respiratory muscle strength and physical performance compared to those undergoing standard rehabilitation alone.

Acute Exercise Induced Compartment Syndrome: A complication of late diagnosis

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Objectives: Acute exercise-induced compartment syndrome (AEICS) of the leg is an acute compartment syndrome occurring without trauma or pre-existing risk factors following exercise. **Methods:** A 34-year-old man presented with acute leg muscle spasms 20 minutes after a basketball game without trauma history. His right leg swelled over the anterior part with pain, though he could still walk. He visited a general practitioner, received analgesics for diagnosed muscle strain, but returned with severe pain and sought hospitalization 36 hours later. Imaging revealed no hematoma or fracture but showed evidence of myositis in the anterior compartment. AEICS was diagnosed, and fasciotomy performed, though muscle necrosis had developed. **Results:** Delayed diagnosis led to permanent morbidity as AEICS symptoms mimic soft tissue injury, and conventional radiology often fails to diagnose. Clinical assessment and compartmental manometry aid diagnosis, with urgent decompressive fasciotomy as the only treatment. **Conclusion:** Despite its rarity, healthcare providers, especially primary care, emergency, and sports physicians, should suspect AEICS in patients with disproportionate leg pain post-exercise.

The Reform of Teaching Evaluation in China's Physical Education Curriculum

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Objectives: The reform of physical education in China aims to cultivate students' interest in physical activity and motor skills, improve their physical fitness and well-being, and contribute to educational reform and development in the country. **Methods:** In response to directives from China's Ministry of Education to enhance teaching evaluation, this study identifies existing challenges and proposes corresponding solutions. **Results:** 1) Commencing with the development of a comprehensive evaluation index system is crucial for effective teaching evaluation. Defining evaluation objectives and content before implementation, utilising diverse evaluation methods, and selecting appropriate approaches tailored to various stages and student characteristics are imperative. 2) Existing teaching evaluation indicators may inadequately capture students' learning achievements and comprehensive quality. Proposed solutions include enhancing movement performance evaluation, incorporating subcategories for primary and specialised motor abilities, and integrating assessments of language expression and embodiment skills. 3) The evaluation subject is the teacher. To enhance the convenience and accuracy of evaluation, artificial intelligence (AI) integration is suggested. This study proposes integrating AI evaluation systems with traditional manual evaluations to offer appropriate suggestions and guidance. 4) Regulating students' extracurricular physical activity presents challenges. Physical education instructors should focus on "subject integration," "classroom and extracurricular integration,"

and "home-school integration." Establishing a physical education homework system is recommended, detailing assignments' content, frequency, and timing. **Conclusion:** Enhancing teaching evaluation is crucial for improving the quality of physical education instruction and fostering students' physical and mental well-being.

The Impact of Physical Exercise on CD4+ Count in People with HIV/AIDS: A review of systematic review

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Objectives: Individuals with HIV/AIDS experience compromised immune systems due to CD4+ cell depletion. This review aims to investigate the effects of exercise on CD4+ cell count in this population. **Methods:** Three databases were searched for systematic reviews comparing exercise + usual care versus usual care alone in patients with HIV/AIDS, using keywords "physical exercise," "CD4+ count," and "HIV/AIDS." There were no restrictions on publication date or study location, but reviews were limited to those published in English or Bahasa Indonesia. **Results:** The search yielded 7 studies, of which 2 met inclusion criteria: two systematic review and meta-analysis studies (both published in 2022). Conflicting conclusions were drawn regarding the impact of physical exercise on CD4+ levels. One study reported no significant effect of physical exercise on CD4+ counts ($P = 0.16$, 95% confidence interval [CI]: -16.57–103.75), while the second study observed a significant improvement in CD4+ count following high-intensity aerobic exercise ($P < 0.01$, 95% CI: 15.58–93.59). **Conclusion:** Two studies present conflicting results regarding the effect of exercise on CD4+ cell counts compared between non-exercise and intervention groups. The type of exercise prescribed to patients may influence the effect of exercise on CD4 count.

Which is Better - UV Light Exposure Intensity Versus Vitamin D Intake on Vitamin D Serum and Osseous Mineral Content Among School-Aged Children in Indonesia: A cross-sectional study

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Objectives: UVB radiation exposure to the skin plays a crucial role in synthesising serum vitamin D, which is essential for bone mineralisation. This study aims to investigate the association between UV light exposure intensity, vitamin D intake, serum vitamin D levels, and osseous mineral content among school-aged children in Indonesia. **Methods:** Secondary data from the South-East Asian Nutrition Surveys (SEANUTS) II in Indonesia, involving 139 school-aged children, assessed UV light exposure using UVB badges, determined vitamin D intake using NutriSurvey software for a one-day 24-hour recall, and analysed serum vitamin D levels through blood tests. **Results:** This study comprised 139 children, 70 boys and 69 girls, from rural (48.9%) and urban (51.1%) areas. The average UV light exposure was 2.47 (1.9) SED, vitamin D intake was 1.67 (3.03) µg, and serum vitamin D was 52.7 (21.2) ng/ml. Serum vitamin D positively correlated with osseous mineral content ($P = 0.018$; $r = 0.201$), and UV light exposure showed a positive correlation with serum vitamin D ($P = 0.03$; $r = 0.249$) but not significantly with osseous mineral content ($P = 0.392$). Daily vitamin D intake showed no significant association with serum vitamin D ($P = 0.817$) or osseous mineral content ($P = 0.163$). **Conclusion:** Daily UV light exposure has a modest correlation with serum vitamin D levels, while vitamin D intake does not. Further path analysis is necessary to elucidate direct links between UV exposure, vitamin D levels, and bone health for comprehensive understanding.

Evolutionary Discourse Analysis of Vegan and Vegetarian Diets: A corpus-based study using usage fluctuation analysis on academic abstracts

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Objectives: The Usage Fluctuation Analysis (UFA) methodology, conceptualised by McEnery and Brezina in 2019, offers linguistic insights by examining word usage patterns through collocation, blending quantitative and qualitative discourse analysis techniques. This research aims to dissect the evolving narrative surrounding vegan and vegetarian diets by employing UFA to scrutinise expressions related to these diets in academic abstracts. The goal is to illuminate the cultural influences on dietary choices and their impact on health paradigms. **Methods:** A specialised corpus of 1,230 abstracts from academic papers listed in the Web of Science Core Collection (covering 2019 to 2023) formed the basis for this analysis. Using the CQP web and UFA Tool, the study analysed collocational frameworks surrounding the keywords "vegetarian" and "vegan" within these abstracts. **Results:** The investigation delineates two primary categories of collocates: consistent and transient. "Diet" emerges as a consistent collocate for both diets. However, transient collocates, characterised by their frequency of occurrence, include "food," "lifestyle," "religion," and "health." A notable distinction is observed in the emphasis placed by "vegan" on "health" and "lifestyle," contrasting with "vegetarian," which predominantly aligns with "eating habits." **Conclusion:** This analysis moves beyond linguistic examination to explore the intersection of social culture and individual dietary choices, prompting critical discussion on editorial biases within academic discourse. The findings underscore the fluidity of diet-related narratives and their broader implications for understanding cultural shifts and health trends.

Nutritional Rickets in Paediatric Athlete Presented with Left Wrist Pain: A rare occurrence

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Objectives: Bone health in paediatric athletes requires special attention. Vitamin D insufficiency, defined as a serum 25-hydroxyvitamin D (25(OH)D) level of 30–50 nmol/L, can lead to nutritional rickets. This case report outlines an instance of nutritional rickets presenting with wrist pain in a professional paediatric gymnast. **Methods:** A 13-year-old girl, a national-level gymnast yet to attain menarche,

presented with traumatic left wrist pain. Initially diagnosed as Gymnast Wrist due to metaphyseal plate fraying seen on X-ray, she wore a below-elbow backslab for 2 weeks and attended regular physiotherapy sessions. MRI confirmed a Salter Harris Type 1 metaphyseal fracture with radiological evidence of rickets. Blood investigations revealed low 25-hydroxyvitamin D (42 nmol/L), elevated serum parathyroid hormone (7.37 pmol/L), normal calcium level (2.24 mmol/L), phosphate level (1.37 mmol/L), and elevated alkaline phosphatase (259 U/L). Nutritional assessments showed inadequate protein and energy intake, with a lack of knowledge on nutritional requirements. **Results:** The patient received co-management with a paediatric endocrinologist and underwent nutritional intervention, including calcium carbonate 1,000 mg twice daily and vitamin D supplements (25,000 IU weekly). The backslab was replaced with a thermoplastic splint for 1 month, and she returned to sport after 3 months of rehabilitation. **Conclusion:** Rickets should be considered in all athletes presenting with gymnast wrist. Diagnosis relies on clinical findings, blood tests, and radiographic evaluation. Treatment involves medical management, dietary modification, and sunlight exposure for this specific athlete.

The Association Between High-Calorie Food Consumption and Body Fat Percentages Among School-Aged Children in Indonesia: A cross-sectional study

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Objectives: Childhood overweight and obesity in Indonesia, as per South-East Asian Nutrition Surveys (SEANUTS) II, stands at 16.8% based on BMI-for-age Z-scores. Despite inconsistencies in BMI-BF% correlation, unhealthy dietary habits such as high-calorie food consumption elevate body fat percentage (BF%), impair performance, and contribute to various non-communicable diseases (NCDs). This study aims to investigate high-calorie food consumption habits among Indonesian school-aged children and their association with BF%. **Methods:** This study examines 1090 school-aged children from SEANUTS II Indonesia, using the Child Food Habit Questionnaire (CFHQ) and InBody 120 for BF% assessment. **Results:** Many Indonesian children consume high-calorie foods daily, with 54.7% consuming fried food, 31% sugary drinks, and 27.3% confectionery. Additionally, 36.9% and 25.1% consume instant noodles and packet snacks 2–3 times weekly, while 22.6%, 62%, and 27.7% never consume traditional snacks, fast food, and frozen processed food. The average BF% is 22.98%, with most subjects at 18.1%. Bivariate analysis reveals significant differences in BF% among groups consuming confectionery ($P = 0.019$), fast food ($P = 0.004$), frozen processed food ($P = 0.001$), and biscuits ($P = 0.009$). Children who never consumed snacks and frozen food tend to have the lowest BF%, while those who never consumed fast food or consume it monthly have the lowest BF% overall. Multiple linear regression adjusted for age, sex, and residence found fast food ($\beta = 0.289$; $P = 0.008$) and frozen processed food consumption ($\beta = 0.517$; $P < 0.001$) significantly influence BF%. **Conclusion:** BF% significantly associates with fast and frozen processed food consumption, emphasising the importance of stakeholders promoting healthy eating habits. Further research is needed to determine other related factors.

Exploring the Correlation Between Serum Vitamin D Levels and Physical Performance Among School-Aged Children in Indonesia: A cross-sectional study

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Objectives: Vitamin D deficiency is a significant concern across all age groups, including children. The SEANUTS I study reported that approximately 44% of Indonesian school-aged children had insufficient vitamin D levels, with considerably lower average concentrations than in other countries. Vitamin D plays a crucial role in muscle function, thereby directly influencing physical performance. This study aims to determine the correlation between serum vitamin D levels and physical performance in Indonesian school-aged children. **Methods:** This study involved 167 children aged 7 to 12 in Indonesia. Using secondary data from the South-East Asian Nutrition Surveys (SEANUTS) II in Indonesia, we examined serum vitamin D levels and physical performance metrics, including hand grip strength, standing long jump, 30-second sit-up, V-sit reach, and VO_2 max. Statistical analysis employed Pearson's and Spearman's correlation tests. **Results:** Among the participants, 58.7% had adequate vitamin D levels, 36.5% exhibited insufficiency, and 4.8% were deficient. The average serum vitamin D level was 54.3 nmol/L. Bivariate analysis revealed a significant correlation between serum vitamin D levels and both standing long jump ($P = 0.044$; $r = 0.156$) and VO_2 max ($P = 0.016$; $r = 0.186$). No significant correlation was found between vitamin D levels and hand grip strength ($P = 0.182$; $r = -0.104$), 30-second sit-up ($P = 0.558$; $r = 0.046$), or V-sit reach ($P = 0.076$; $r = -0.138$). **Conclusion:** Approximately 40% of Indonesian school-aged children had insufficient vitamin D levels. A significant correlation was found between vitamin D levels and the results of standing long jump and VO_2 max tests. Further research is necessary to gain a deeper understanding of these findings.

Evaluation of Differentiating Attacking and Defensive Performance for Various Playing Positions During the Tokyo Olympics Men's Basketball Competition

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Objectives: This study aimed to compare attacking and defensive performance indicators between the top and bottom performing teams in the men's basketball competition at the Tokyo Olympics. **Methods:** The rank-sum ratio (RSR) was used to evaluate and describe the attacking and defensive abilities of 144 male players from 12 participating teams. Players were grouped by playing position: centres ($n = 27$), forwards ($n = 58$), and guards ($n = 59$). Statistical analyses were conducted to test the differences and relationships between various variables. **Results:** The findings indicated no significant differences in all attacking and defensive performance indicators between the top and bottom teams for centres and forwards ($P > 0.05$). However, for guards, top teams performed significantly better offensively than bottom teams, particularly in points per game (PPG; $P = 0.035$), two-point percentage (2P%; $P = 0.035$), and offensive rebounds ($P = 0.030$). Additionally, only the attacking and defensive RSR ranks for the guard position showed a positive correlation ($r = 0.692$) with the final rankings. Thus, the strength of attacking and defensive capabilities at the guard position emerged as a critical factor in differentiating top teams from bottom teams. Moreover, PPG, offensive rebounds, assists, and defensive rebounds were crucial across

all playing positions ($r > 0.700$; $P < 0.05$), indicating the continuing trend towards player versatility in basketball. **Conclusion:** These results suggest that coaches and players should focus on targeted training to enhance the overall strength of their teams, and provide useful insights for talent selection across different playing positions.

Muscle Strength and Foot Pressure Vary Depending on the Type of Foot Pain

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Objectives: This study aimed to compare muscle strength and foot pressure between patients with metatarsalgia, plantar fasciitis, and healthy controls. **Methods:** The study involved 31 patients with foot pain (14 with metatarsalgia and 17 with plantar fasciitis) and 29 healthy controls. Muscle strength of the plantar flexor and hip muscles was measured using an isokinetic dynamometer and handheld dynamometer, respectively. Foot pressure parameters, including the pressure-time integral (PTI) and foot arch index (AI), were assessed using pedobarography. **Results:** Compared to the healthy control group, plantar flexor strength was significantly reduced in the affected feet of both the metatarsalgia and plantar fasciitis groups (all $P < 0.001$). However, hip strength was significantly decreased only in the metatarsalgia group ($P < 0.001$). Specifically, plantar flexor strength ($P < 0.001$) and hip strength ($P = 0.004$) were significantly lower in the metatarsalgia group than in the plantar fasciitis group. PTI was lower in the forefoot of affected feet in both metatarsalgia ($P < 0.001$) and plantar fasciitis ($P = 0.004$), but significantly higher in the rearfoot for both conditions (all $P < 0.001$). The foot AI ($P < 0.001$) was significantly reduced only in the metatarsalgia group. **Conclusion:** Patients with metatarsalgia exhibit weaker plantar flexor and hip muscle strength compared to those with plantar fasciitis and healthy controls. Additionally, the PTI in the forefoot and the foot AI were reduced in patients with metatarsalgia, whereas the PTI in the rearfoot was higher in patients with both metatarsalgia and plantar fasciitis.

Resistance Exercise Reduces Short-Term Blood Pressure Variability: A meta-analysis of randomised controlled trials

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Objectives: Increased blood pressure variability (BPV) is associated with cardiovascular diseases. While exercise is known to improve blood pressure, its impact on BPV is uncertain. This study evaluates the association between exercise and short-term BPV. **Methods:** Randomised controlled trials examining the effects of exercise on short-term BPV were identified through MEDLINE, Embase, Web of Science, Cochrane, and PsycINFO on 14 December 2023. Systolic and diastolic BPV (SBPV and DBPV) were measured using standard deviations (SD), coefficient of variation (CV), and average real variability (ARV) from 24-hour ambulatory blood pressure monitoring. Standardised mean differences (SMD) were calculated to assess changes in BPV pre- and post-exercise. Heterogeneity was assessed using I^2 , and random-effects models were employed to synthesise the evidence. **Results:** Out of 2,234 studies identified, 12 met the eligibility criteria. Eleven studies reported short-term BPV as the main outcome, while one study reported long-term BPV. Among studies reporting short-term BPV, 7 used ARV, and others used SD and CV. In total, 316 participants from 7 studies indicated that exercise improved SBPV (SMD [95% CI] = -0.77 [-1.57 – -0.03]) and DBPV (-0.56 [-0.80 – -0.32]). Isometric exercise showed improvements in SBPV (-1.72 [-3.42 – -0.03]) and DBPV (-0.47 [-1.16 – -0.21]). Aerobic exercise showed improvements in SBPV (0.03 [-0.42 – -0.48]) and DBPV (-0.43 [-1.58 – -0.72]). **Conclusion:** Exercise can reduce short-term BPV, with isometric exercise being more effective than aerobic exercise in reducing both SBPV and DBPV.

Tandem Gait can Better Reflect the Limb Asymmetry of Athletes After Anterior Cruciate Ligament Reconstruction than Stable Gait

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Objectives: This study aimed to determine which gait pattern more accurately reflects limb asymmetry in athletes following anterior cruciate ligament reconstruction (ACLR). **Methods:** Forty-two football players, who had undergone unilateral ACLR and failed to meet the return-to-sport (RTS) criteria, completed functional tests and biomechanical gait analysis 6-12 months post-surgery. Tandem and stable gaits were compared. A three-dimensional motion analysis system (Fastmove, 100 Hz) was used to measure hip, knee, and ankle angles. A three-dimensional dynamometer (Kistler, 2,000 Hz) was employed to compare hip, knee, and ankle moments, as well as vertical reaction forces. An electric collection system (Delsys 16, 2,000 Hz) was used to assess muscle root mean square (RMS) timings. **Results:** During the single support phase, the symmetry index for maximum hip flexion angle, maximum knee flexion angle, and maximum plantar flexion angle in tandem gait were significantly lower than those in stable gait ($P < 0.05$). Tandem gait demonstrated lower knee flexion moment ($P = 0.002$), knee power ($P = 0.01$), ankle power ($P = 0.045$), and peak vertical ground reaction force ($P = 0.006$). During the double support phase, no significant differences were observed in the symmetry index for maximum hip and knee flexion angles between the two gaits, but the symmetry index for maximum plantar flexion angle in tandem gait was significantly lower than in stable gait ($P < 0.05$). Tandem gait also showed lower knee flexion moment ($P = 0.003$), knee power ($P = 0.001$), ankle power ($P = 0.028$), and peak vertical ground reaction force ($P = 0.001$). **Conclusion:** Compared to stable gait, tandem gait more effectively reflects limb asymmetry in ACLR athletes. This insight can guide postoperative rehabilitation and expedite their return to competition.

Effect of Yoga and Strength Training on Knee Instability, Pain and Stiffness in Women with Knee Osteoarthritis: A randomised controlled trial

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Objectives: This study aimed to evaluate the effects of yoga and strength training on knee osteoarthritis (KOA) symptoms. **Methods:** Thirty-six women with KOA were randomly assigned to yoga ($n = 12$), strength training ($n = 12$), or control ($n = 12$) groups. The experimental groups underwent 8 weeks of yoga or strength training. Outcomes measured before and after the intervention included pain visual analogue score (VAS), balance (Berg Balance Scale, BBS), quadriceps muscle strength (dynamometer), knee flexion

range of motion (ROM), knee stiffness (Western Ontario and McMaster Universities Arthritis Index, WOMAC), and knee function (Knee Injury and Osteoarthritis Outcome Score, KI). **Results:** Both yoga and strength training significantly improved KI, VAS, and BBS over time ($P < 0.05$). However, improvements in WOMAC (stiffness), knee flexion ROM, and quadriceps strength were significant only in the yoga group ($P < 0.05$). Post-hoc analysis revealed significant differences in VAS, KI, and BBS between intervention and control groups ($P < 0.05$), while significant differences in WOMAC (stiffness) were observed only between the yoga and control groups ($P = 0.05$). **Conclusion:** Yoga and strength training both effectively improved balance, pain, and knee function in KOA patients, but yoga had a greater impact on knee stiffness, quadriceps strength, and knee flexion ROM compared to strength training.

The Effects of Daily and Weekly Training Sessions on the Shoulder Rotational Strength and Range in Young Front-Crawl Swimmers

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Objectives: This study aimed to evaluate the impact of daily training sessions on the strength and flexibility of shoulder rotator muscles in young front crawl swimmers. **Methods:** Ten young front crawl swimmers completed a week of intensified training. Isometric shoulder strength of the rotator muscles and passive shoulder internal rotation (IR) and external rotation (ER) range of motion (ROM) were measured before morning training and after afternoon training on the first, second, and fifth days. Swimmers were divided into two groups based on IR ROM: a limited IR ROM group (LIR) and a regular IR ROM group (RIR). Differences and interactions between group and time were assessed using repeated measures two-way ANOVA. **Results:** On the first day, relative ER strength significantly decreased after training ($P < 0.05$; $\eta^2 = 0.813$). By the fifth day, relative ER strength before training had significantly reduced compared to the first day ($P < 0.05$; $\eta^2 = 0.579$). Significant main effects on ER ROM were found for the group ($P < 0.05$; $\eta^2 = 0.417$), time ($P < 0.05$; $\eta^2 = 0.594$), and the interaction between group and time ($P < 0.05$; $\eta^2 = 0.738$). **Conclusion:** Both one-day and one-week training sessions resulted in decreased ER strength in both groups. An increase in ER ROM was observed in the LIR group over the week. Imbalanced rotational strength and ROM are considered risk factors for shoulder injuries in overhead athletes. Corrective exercises to normalise these adaptive changes should be implemented.

Effect of Breath-Holding on Instant Cardiac Function in Elite Rugby Players

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Objective: This study aimed to investigate how different breath-holding conditions affect cardiopulmonary function to identify an optimal warm-up for athletes. **Methods:** Ten elite rugby players (mean age 24.5 ± 1.8 years) performed four cardiopulmonary exercise tests, each preceded by a different breath-hold warm-up: dynamic dry (10 minutes of unloaded cycling while breath-holding), dynamic wet (10 minutes of unloaded cycling with face immersed in cold water while breath-holding), static dry (10 minutes of sitting while breath-holding), and static wet (10 minutes of sitting with face immersed in cold water while breath-holding). Heart rate (HR), stroke volume (SV), and cardiac output (CO) were measured during peak oxygen uptake (VO_2 peak). Differences were assessed using repeated measures ANOVA and post hoc tests. **Results:** HR and SV at VO_2 peak showed significant interactions between dry/wet and dynamic/static conditions (FHR = 6.909, PHR = 0.018; FSV = 7.176, PSV = 0.016). CO significantly differed between wet and dry conditions ($F = 4.804$, $P = 0.043$). Dry conditions resulted in higher SV and CO compared to wet conditions in both dynamic and static settings. HR was significantly lower in dry conditions than in wet conditions during dynamic exercises. **Conclusion:** Dynamic dry breath-holding elicits a faster and stronger cardiovascular response to maximal exercise intensity, indicating its potential as an effective warm-up strategy for athletes.

The Changes of Musculotendinous Architecture of Supraspinatus Associated with Scapulohumeral Kinematics During Scaption in College Volleyball Players

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Objectives: This study aimed to investigate the relationship between scapular kinematics and supraspinatus architecture during scaption in college volleyball players with scapular dyskinesis (SD). **Methods:** Thirteen college volleyball players with SD participated in this study. A motion capture system and sonography were synchronised to measure scapulohumeral kinematics and supraspinatus musculotendinous architecture during scaption. One-way ANOVA compared pennation angle (PA) changes at every 20° increment of scaption. Pearson correlation coefficient assessed the relationship between scapulohumeral kinematics and PA changes. Statistical significance was set at $P < 0.05$. **Results:** No significant differences in PA changes were observed between 0–20°, 20–40°, and 40–60° of scaption. PA showed a significant correlation with scapular upward rotation ($r = 0.70$; $P = 0.01$) during 40–60° of scaption. **Conclusion:** The PA of the supraspinatus increases with muscle contraction as the arm elevates. Scapular upward rotation appears to facilitate supraspinatus contraction during arm elevation in participants with SD. Future studies should examine the effects of scapula-focused interventions on supraspinatus architecture.

Monitoring Training Workload Among Elite Indian Rowers Using an App-Based Athlete Monitoring System

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Objectives: Rowing demands high aerobic and anaerobic capacity, with elite rowers often training for 700–900 hours/year. Prolonged high training workload, especially during the competitive season, can lead to musculoskeletal injuries. The Acute to Chronic Workload Ratio (ACWR) is a vital indicator of workload. App-based Athlete Monitoring Systems (AMS) offer continuous workload monitoring and real-time feedback to sports medicine and sports science personnel. This study evaluates the application of AMS to monitor ACWR in elite Indian rowers. **Methods:** A private water sports facility monitored the training workload of 10 elite male and female rowers using

an app-based monitoring system (AMS). The ACWR was utilised to monitor workload and assess whether rowers were under-training or over-training over a 2-month period. **Results:** Six out of the 10 rowers were over-training (ACWR >1.3), while the remaining four were training within the normal ACWR zone (0.8–1.3). **Conclusion:** This study reveals that 6 out of 10 rowers were in the overtraining zone, putting them at risk of injury. It underscores the simplicity of monitoring ACWR using an app-based AMS. Sports science personnel can leverage AMS to monitor workloads and devise interventions for workload management to prevent injuries.

Immediate and Delayed Effects of Dynamic Leg Stretching on Postural Stability in Young Adults

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Objectives: Postural stability relies on the integration of sensory input, neuromuscular control, and biomechanical factors to maintain body stability and alignment across various environmental conditions. Dynamic leg stretching is considered a potential tool for enhancing postural stability. However, the immediate and delayed effects of dynamic leg stretching remain debated in the research community. This study aims to investigate these effects. **Methods:** Sixty college students were randomly allocated to a dynamic stretching group (DSG; n = 30) or a control group (CG; n = 30). The DSG performed 10 minutes of acute dynamic leg stretching (Front to Back Leg Swing), while the CG received no intervention. Pre- and post-intervention postural stability was assessed using center of pressure (COP) area, COP lengths, and COP speed measured with a Zebris platform. Statistical analyses were conducted using IBM SPSS Statistics with a significance level of $P < 0.05$. **Results:** The DSG exhibited significantly reduced COP area, COP lengths, and COP speed (all $P < 0.05$) compared to the CG during the initial 0–6 minutes following acute dynamic leg stretching. However, no significant differences in COP parameters were observed between groups thereafter. **Conclusion:** This finding suggests that while dynamic leg stretching may offer short-term improvements in postural stability, its effects may not be long-lasting. Future research could explore the potential for repeated or sustained dynamic stretching protocols to produce more enduring benefits. (Ministry of Education of Humanities and Social Science project, NO.19YJC890044; Basic Research Fund of DUT, No. DUT23RW117).

The Relationship Between Trunk and Pelvic Rotation and Shoulder Kinematics During Spiking in High School Male Volleyball Players

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Objectives: Efficient energy transfer from the lower extremity to the hand via the spine is crucial in overhead throwing. Less latency between the onset of trunk and pelvic peak rotational velocity (T-PLRV) during baseball pitching increases stress on the shoulder. In volleyball, shoulder-hip separation angle (S-HSA) during spiking is linked to ball speed. Since volleyball spiking occurs in the air, spinal control may be vital for upper extremity performance. This study aims to examine the relationship between trunk and pelvic rotation and shoulder kinematics during spiking in high school volleyball players. **Methods:** Fourteen elite high school volleyball players were recruited. A motion capture system measured trunk, pelvic, and shoulder kinematics during spiking. Maximum values of S-HSA and T-PLRV were determined from take-off to ball contact. Spearman's rank correlation analysed the correlation between shoulder kinematics and T-PLRV as well as S-HSA. **Results:** Significant correlations were found between S-HSA and the angular velocity of trunk ($r = 0.74$; $P = 0.003$) and pelvis ($r = 0.68$; $P = 0.008$), and the angle of shoulder horizontal adduction ($r = 0.71$; $P = 0.004$). A negative correlation was noted between T-PLRV and the maximal angle of shoulder external rotation ($r = -0.68$; $P = 0.008$). **Conclusion:** Coordinated trunk and pelvic rotations during spiking may aid energy transfer without increasing loads on the shoulder joint.

The Effects of Binge-Like Ethanol Exposure During Adolescence on Motor Behaviour and Oxidative Stress Levels in Adult Male Rats

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Objectives: This study aimed to ascertain whether binge-like ethanol exposure during adolescence altered motor behaviour and oxidative stress parameters in adulthood. **Methods:** Sprague-Dawley rats were divided into Intact and ethanol alone (Intact-eth) groups (n = 8/group). From postnatal day (P) 28 to P65, rats were intermittently exposed to saline or 3.0 g/kg ethanol (25%v/v) via intraperitoneal injection (daily at 5:00 PM). The exposure schedule involved one injection per day for two consecutive days, followed by two days with no injections. This cycle was repeated ten times for a total of 20 injections over 38 days. The open field test and biochemical analysis were adopted to analyse behavioural changes and oxidative stress parameters, respectively. **Results:** The Intact-eth rats exhibited fewer immobile-sniffing events, exploratory behaviours, and less movement duration in the central area compared to the Intact rats ($P < 0.01$). Conversely, the Intact-eth rats demonstrated increased motor behaviours, grooming events, and grooming duration compared to the Intact rats ($P < 0.01$). Furthermore, the activity of Mn-SOD and GSH-PX, as well as the level of GSH in the substantia nigra, significantly decreased in the Intact-eth rats compared to the Intact rats ($P < 0.05$). Conversely, the level of MDA and LPO in the substantia nigra significantly increased in Intact-eth rats compared to the Intact rats ($P < 0.01$). **Conclusion:** Binge drinking during adolescence exerts long-term effects on adult motor behaviour and quantified parameters of oxidative stress.

Ultrasound Guidance to Improve Accuracy when Injections are used in Tendinopathies: Two cadaveric studies

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Objectives: This study aims to assess the precision of needle interventions in tendinopathies, comparing ultrasound-guided and blind approaches. **Methods:** Two cadaveric studies were conducted, involving injections under ultrasound guidance or blindly, with

randomisation of specimens and practitioners. For supraspinatus tendinopathy, 20 fresh cadaveric shoulders and 30 experienced musculoskeletal ultrasound practitioners performed 4 ultrasound-guided and 4 unguided punctures each, totalling 240 punctures analysed in 3 anatomical cuts. For patellar tendinopathy, 26 knees from fresh cadavers were used, and 26 experienced practitioners conducted 6 ultrasound-guided and 6 blind punctures each, resulting in 312 injections analysed across 2 anatomical cuts. A 1cc infiltration of coloured natural latex marked the site of infiltration. Ultrasound examination was performed with a 5–16MHz linear array transducer in longitudinal and transversal views in real-time imaging mode in a standardised manner. The primary response variable analysed was the average distance to the point of the tendon to be treated, categorising this mean as precision. **Results:** Significant differences ($P < 0.0001$) in the distance from the target point were observed in both studies. For supraspinatus tendinopathy, unguided punctures were on average 10mm further from the target than ultrasound-guided punctures, with ultrasound-guided punctures achieving 95% precision and unguided punctures only 12.5% precision. In patellar tendinopathy, the unguided injections were also performed on average 10mm away from the target point compared to ultrasound-guided injections, with ultrasound-guided injections achieving an accuracy of 74.36% and unguided injections only 11.54% accuracy ($P < 0.0001$). **Conclusion:** Ultrasound-guided interventions significantly improve accuracy compared to blind injections. This finding emphasises the importance of ultrasound guidance when injection treatments, such as injections of platelet-rich plasma (PRP), ultrasound-guided galvanic electrolysis technique (USGET), polidocanol, or stem cells, are needed for these conditions.

Electrocardiogram Characteristics of Malaysian Professional Football Players

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Objectives: Cardiovascular screening during pre-competition medical assessment (PCMA) is integral in football to reduce the incidence of sudden cardiac death. However, limited data are available on electrocardiogram (ECG) characteristics among Malaysian footballers. Our study describes the ECG features among Selangor professional football players. **Methods:** A cross-sectional study was conducted using secondary data from footballers' PCMA records performed at the University Malaya Medical Centre in 2022. Players' ECGs were evaluated using the International Criteria 2017. **Results:** Data from 86 Malaysian footballers were evaluated. ECGs of 80 (93%) footballers were categorised as normal for athletes, two (2.2%) had abnormal ECGs, and the remaining four (4.8%) had borderline ECGs. The most common ECG features in this study were sinus bradycardia 96.5% ($n = 83$), followed by left ventricular hypertrophy 78% ($n = 67$), and benign early repolarisation 13% ($n = 11$). One footballer had T-wave inversion ECG changes over the lateral lead, and another had features suggestive of Wolff-Parkinson-White syndrome. Both footballers were referred for further evaluation and declared fit to play by a cardiologist. Older footballers showed a significantly lower resting heart rate compared to young adults. Overweight and obese footballers had a significantly higher QTc interval. **Conclusion:** Our study demonstrates football-specific ECG adaptations (high sinus bradycardia and left ventricular hypertrophy with low early repolarisation). Maintaining a normal BMI is important to reduce the risk of prolonged QTc, which is a risk factor for sudden cardiac death.

The Immediate Effect of Ipsilateral and Contralateral Sacroiliac Manipulation and Sham Laser on Hip Range of Motion and Kicking Velocity in Soccer

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Objectives: A close biomechanical relationship exists between the sacroiliac and hip joints. Optimal hip range of motion (ROM) in both limbs may enhance kicking velocity. Soccer players often experience decreased hip ROM, predisposing them to injuries that can affect kicking velocity. This study aims to determine the effect of ipsilateral sacroiliac joint manipulation versus contralateral sacroiliac joint manipulation on bilateral hip ROM and kicking velocity. **Methods:** Three groups of twenty soccer players each, with a mean age of 21, height of 1.7 m, and weight of 65 kg, participated. All players were right dominant. The groups included ipsilateral sacroiliac manipulation, contralateral sacroiliac manipulation, and sham laser (placebo). Hip ROM was measured bilaterally pre- and post-manipulation using the Saunders digital inclinometer with baseline measurements. Kicking velocity was measured using a speed sport radar gun. Each group received a single intervention, with the laser group receiving detuned laser. **Results:** The ipsilateral intervention group showed improvements of 1.4–2.6 degrees in hip motion (flexion, extension, rotation) bilaterally. Kicking velocity increased by 4.5 km/hr on the dominant limb (right side). The contralateral intervention group improved by 1.3–2.5 degrees in hip motion (extension, rotation) bilaterally, with a similar increase in kicking velocity. Perception changes were strongly associated with actual kicking velocity, and a correlation was found between changes in hip ROM and kicking velocity. **Conclusion:** Manipulation may enhance hip ROM and kicking velocity, suggesting its potential benefit for soccer players.

A Study on Factors Related to Sports Injuries among Young Athletes' in Sri Lanka

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Objectives: This study aimed to describe the patterns and factors associated with sports-related injuries among young athletes in Kurunegala, Sri Lanka. **Methods:** A descriptive cross-sectional study was conducted involving young athletes aged below 18 years. Data were collected using a validated questionnaire reviewed by a panel of experts, along with clinical notes on injury management. **Results:** Out of 410 responses, 42.1% reported a high frequency of injury, with 23.4% experiencing major injuries. Several factors were associated with an increased injury risk. Inadequate endurance (adjusted odds ratio [AOR] = 2.1, confidence interval [CI] = 1.23–3.58) and strength training (AOR = 1.58, CI = 1.21–1.85) were linked to a higher injury frequency. External factors such as lack of coaching qualification (AOR = 3.7, CI = 1.12–7.28), high intra-team competition (AOR = 3.29, CI = 1.06–5.92), and absence of special dietary regimens (AOR = 1.15, CI = 1.05–1.35) were identified. Other factors included fewer years of sports engagement (AOR = 1.3, CI = 1.12–1.77), fewer games played in the previous year (AOR = 1.43, CI = 1.26–1.74), and lack of safety equipment (AOR = 1.53, CI = 1.31–1.91). High injury frequency (AOR = 1.84, CI = 1.1–3.1) and severity (AOR = 1.53, CI = 1.3–1.92) were determinants for anxiety about continued sports engagement. Regarding injury management, only 47.8% had access to specialised sports units for treatment, and 34.1% had access to physiotherapy. Home remedies were commonly used by athletes (57.2%) for injury management. **Conclusion:** Professional guidance, including advice on training load, qualified coaching, dietary regimens, and access to specialised sports injury management units, is essential to mitigate the risk of injuries among young athletes in schools.

Suprascapular Nerve Injury in Patient with Distal Clavicle Fracture

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Objectives: Suprascapular nerve injury is a rare complication of clavicle fractures, often presenting with neurologic symptoms either immediately or delayed after the injury. This case report discusses the diagnosis and treatment of suprascapular nerve injury in a patient with a distal clavicle fracture. **Methods:** A 34-year-old male sustained an open comminuted fracture of the right distal clavicle and neck of the scapula following a motor vehicle accident. The patient underwent multiple surgeries, including K-wiring of the right clavicle, followed by clavicle locking plate placement, bone grafting, and tightrope stabilisation of the coracoclavicular ligament due to non-union of the right distal clavicular fracture. Throughout the treatment course, the patient experienced limited range of motion in the right shoulder, particularly abduction, forward flexion, and external rotation, accompanied by muscle atrophy. After four months post-operation, the patient was referred to the Sports Medicine team for strengthening exercises due to persistent range of motion limitations despite surgical intervention. **Results:** Based on history and examinations, suprascapular nerve injury was suspected, and nerve conduction studies confirmed evidence of right suprascapular nerve injury. Rehabilitation focused on shoulder range of motion and strengthening exercises. **Conclusion:** Patients presenting with distal clavicle fractures should be evaluated for suprascapular nerve injury. Further assessment with nerve conduction studies or electromyography is recommended when suprascapular nerve injury is suspected. Rehabilitation exercises should primarily target strengthening the rotator cuff muscles and other shoulder musculature.

Evaluation of the Efficacy of 4-week Myofascial Release on Pain, Negative Psychology and Daily Activities in Patients with Chronic Non-Specific Lower Back Pain

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Objectives: This study aims to investigate the efficacy of myofascial release on chronic non-specific low back pain. **Methods:** Forty patients with chronic nonspecific low back pain admitted to our hospital from December 2021 to December 2022 were selected and randomised in a 1:1 ratio into the myofascial release therapy group (MFR, n = 20) or the Pseudofascial release control group (PRCG, n = 20). Lumbar and abdominal fasciae release in the MFR group and gentle strokes to the same area as a placebo-controlled treatment in the PRCG group were conducted for 40 minutes each time and three times a week for 4 weeks. The following parameters were measured before and after myofascial release: Visual Analogue Scale (VAS) score, Japanese Society of Orthopaedics Low Back Pain Rating Scale (JOA), Activities of Daily Living Scale (ADL), Oswestry Dysfunction Index (ODI), Lumbar Range of Motion, Anxiety Self-rating Scale (SAS), Depression Self-rating Scale (SDS), and serum levels of Inflammatory Factor Changes. **Results:** After treatment compared to the PRCG group, Patients in the MFR group had reductions in SAS by 59.2% (MRF versus PRCG = 27.69 ± 5.61 versus 62.81 ± 7.56; $P < 0.001$, OR [95% CI]: 0.44 [36.11–44.51]), SDS by 63.4% (MRF versus PRCG = 25.13 ± 4.00 versus 65.88 ± 3.90; $P < 0.001$, OR [95% CI]: 0.38 [39.50–47.63]), VAS by 67.2% (MRF versus PRCG = 2.44 ± 1.03 versus 7.50 ± 0.82; $P < 0.001$, OR [95% CI]: 0.32 [4.05–5.95]), JOA by 59.8% (MRF versus PRCG = 9.50 ± 2.13 versus 25.25 ± 2.18; $P < 0.001$, OR [95% CI]: 0.37 [10.65–14.97]), ADL by 50.4% (MRF versus PRCG = 83.25 ± 3.86 versus 43.00 ± 5.47; $P < 0.001$, OR [95% CI]: 1.93 [–46.60–37.40]), ODI by 95.9% (MRF versus PRCG = 83.25 ± 3.86 versus 43.00 ± 5.47; $P < 0.001$, OR [95% CI]: 1.93 [21.81–26.44]), lumbar anterior flexion by 29.1% (MRF versus PRCG = 125.45 ± 2.7 versus 89.88 ± 3.33; $P < 0.001$, OR [95% CI]: 1.40 [–39.81–33.25]), posterior extension by 49.2% (MRF versus PRCG = 32.86 ± 1.28 versus 18.96 ± 1.51; $P < 0.001$, OR [95% CI]: 1.77 [–17.11–15.04]). **Conclusion:** Myofascial release is an effective clinical intervention because it may alleviate inflammation levels and reduce the incidence of negative psychological states, such as anxiety and depression, in patients with chronic nonspecific low back pain, reduce the pain threshold, and increase the range of motion of the lumbar joint.

Conservative Approach to Proximal Adductor Longus Avulsion Injury with Rehabilitation Outcome: A case report

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Objectives: Currently, there is no clear agreement on the indication for surgery, with various literature citing 2 to 3cm retraction as an indication for surgery. We report a 12-week post-injury outcome on a conservatively treated proximal adductor longus avulsion of 2.5cm retraction in a recreational athlete. **Methods:** A 12-week follow-up on a newly diagnosed adductor avulsion injury in a 31-year-old male recreational futsal player with no known previous adductor injury. MRI was done at 3 weeks post-injury to confirm the full extent of the injury. The patient was conservatively treated with short-term oral NSAIDs and progressive exercise programmes of hip stretching, range of motion, balance training, isometric hip, and weighted adductor strengthening over a 4-week duration. Patient-reported outcomes were measured using Modified Harris Hip Score (MHHS), Hip Outcome Score - Activity of Daily Living (HOS-ADL), and Sports (HOS-Sports). **Results:** A closed kinetic chain injury to the stabilising hip was diagnosed clinically as an adductor complex injury. MRI revealed a proximal adductor avulsion with a bony fragment and distal retraction of 2.5 cm. At 12 weeks post-injury, the patient returned to jogging and single-leg jumps pain-free with slight adductor tightness. The patient reported very good outcomes with Modified Harris Hip Score (MHHS) of 95.6%, Hip Outcome Score - Activity of Daily Living (HOS-ADL), and Sports (HOS-Sports) subscales of 98.3% and 90%, respectively. **Conclusion:** In an isolated proximal adductor avulsion injury of 2.5 cm retraction, conservative rehabilitation appears to be a viable option. MRI is important in assisting treatment decisions. However, longer follow-up is needed to assess the long-term outcome.

Does Functional Rehabilitation Improve Outcomes After Double-Row Suture Anchor Repair for Insertional Achilles Tendinopathy?

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Objectives: This retrospective study compared two groups of patients who underwent double-row surgical technique for the treatment of Insertional Achilles Tendinopathy. Group 1 (G1) underwent non-functional (classical) rehabilitation, while Group 2 (G2) underwent early and functional postoperative rehabilitation. **Methods:** We retrospectively reviewed the charts of patients with insertional

Achilles tendinopathy who underwent surgical correction of Achilles tendinosis with complete detachment of the Achilles tendon and subsequent reattachment with double row suture (SpeedBridge System - Arthrex, Naples, FL) from August 2010 to 2020. A total of 63 patients (68 feet) were included in this study, with 48 patients (51 feet) in G1 and 17 patients (17 feet) in G2. After a minimum 2-year follow-up (ranging from two to nine years with a mean of 32 months), pre- and post-op information from all patients in both groups were compared. **Results:** Visual Analog Pain Scale (VAS) pre/post G1 (7.49/1.39), G2 (7.8/2.2), showed no statistically significant difference ($P = 0.89$). Postoperative FAAM-AVD scores were slightly higher in G1 compared to G2 ($P = 0.01167$). Male patients exhibited better scores than females in both VAS and FAAM-AVD scores. **Conclusion:** Regardless of the postoperative approach performed, patients substantially improved their preoperative pain and functional status, irrespective of gender, suggesting the chosen technique was effective.

Retro Walking in a Therapeutic Context: A systematic review

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Objectives: The main aim of this study was to determine the therapeutic benefits of retro walking for physical therapists. **Methods:** The research design employed a systematic review using the PRISMA method. Both randomised and non-randomised controlled trials that utilised retro walking and/or backward walking were included. The search of published literature was conducted using databases, with sources dated before 1 November 2021 in a physical rehabilitation context. The included studies involved adults (aged above 18 years) of both genders, with only full-text articles in English considered. Articles meeting the inclusion criteria were analysed using a data extraction form. Six articles were included and analysed to address the research question. **Results:** Retro walking showed benefits in the treatment of knee osteoarthritis by reducing knee pain, improving functional ability, and enhancing quadriceps strength, resulting in better rehabilitation outcomes. Additionally, retro walking, when used alongside conventional balance training and lateral walking, contributed to improvements in balance, walking speed, and cardiopulmonary fitness in acute and chronic stroke rehabilitation, beneficial for activities of daily living and restoring functionality. Furthermore, retro walking may aid in decreasing body mass index (BMI) and waist circumference (WC), potentially reducing the risk of non-communicable diseases (NCDs). **Conclusion:** Retro walking is essential in physical therapy due to its associated benefits, ease of administration, and low cost. Future research should focus on backward walking outside clinical settings to achieve rehabilitation goals.

Scapular Upward Rotation in High School Competitive Swimmers with and Without Shoulder Pain

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Objectives: Several studies have highlighted inappropriate scapular kinematics, notably scapular upward rotation, as a primary factor contributing to shoulder pain among competitive swimmers. However, conflicting evidence exists regarding scapular upward rotation, with literature reporting both insufficient and excessive rotation. Hence, this study aimed to investigate scapular upward rotation in high school competitive swimmers with and without shoulder pain. **Methods:** Fourteen high school competitive swimmers (aged 16.36 ± 0.84 years) with shoulder pain and 14 counterparts without shoulder pain (aged 15.92 ± 0.86 years) were enrolled. The Shoulder Pain and Disability Index assessed shoulder pain and function in all participants. Scapular upward rotation angle was measured using a digital inclinometer at 0°, 60°, and 120° of humeral elevation in the scapular plane. The independent t-test compared differences between groups. **Results:** A significant difference in scapular upward rotation at 0° was observed between the two groups ($P < 0.05$). **Conclusion:** High school competitive swimmers with shoulder pain exhibited common excessive scapular upward rotation at 0°. These findings underscore the importance of evaluating and training scapular kinematics in high school swimmers experiencing shoulder pain.

Effects of a Two-Week Preoperative Physical Therapy Intervention Combined with a Four-Week Postoperative Physical Therapy Intervention in Patients Undergoing Total Knee Replacement

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Objectives: Total knee replacement (TKR) surgery stands as the most effective therapeutic option for patients suffering from severe knee osteoarthritis. Nevertheless, a considerable number of patients continue to experience persistent deficiencies in sensorimotor function and strength post-TKR surgery. Several studies have highlighted the effectiveness of integrating TKR with physical therapy (PT) to alleviate pain and enhance functional ability. Therefore, this study aimed to investigate the efficacy of a two-week preoperative PT intervention followed by a four-week postoperative PT intervention on functional performance and muscle strength in patients undergoing TKR. **Methods:** Eleven patients (aged 73.1 ± 6.85 years) participated in this study. They underwent a two-week preoperative and four-week postoperative PT intervention to improve their functional performance and muscle strength. All patients completed the time up-and-go test (TUG), muscle strength test, and 6-minute walk test before and after the four-week postoperative PT intervention. Discrepancies in test results before and after the intervention were evaluated using the paired t-test. **Results:** Following the combined two-week preoperative and four-week postoperative PT interventions, significant improvements were noted in TUG results (baseline: 18.53 ± 12.42 s; post-therapy: 16.19 ± 12.41 s; $P < 0.05$). **Conclusion:** The combination of a two-week preoperative and four-week postoperative PT intervention has shown efficacy in enhancing functional performance and lower extremity muscle strength for patients undergoing TKR. Thus, implementing a protocol comprising two weeks of preoperative PT followed by four weeks of postoperative PT could be considered a standard training regimen for TKR patients.

Ankle Exercise can Improve Balance After Total Knee Arthroplasty

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Objectives: Approximately 23% of Total Knee Arthroplasty (TKA) patients report experiencing falls within 8 weeks post-surgery. Recent studies suggest that biomechanical abnormalities in the ankle joint and balance disorders may contribute to these falls. Therefore, we conducted an 8-week ankle training programme to investigate its efficacy in improving balance among TKA patients. **Methods:** Thirty-four knees from 34 patients who underwent TKA and received rehabilitation therapy at our department between October 2022 and October 2023 were randomly allocated into two groups: the control group (n = 17) and the intervention group (n = 17). Both groups underwent 8 weeks of standard therapy, including quadriceps strength training, weight bearing, and balance training. Additionally, the intervention group received an extra 8 weeks of ankle muscle strength training and dynamic balance training using a balance instrument (PK254, TecnoBody, Italy). The Berg Balance Scale (BBS) and average track error (ATE) of dynamic balance measured by PK254 were used to evaluate balance at baseline, 4th week, and 8th week during the intervention. **Results:** There was no significant difference in BBS and ATE between the two groups at baseline ($P > 0.05$). Both groups demonstrated improved BBS and ATE at the 4th and 8th weeks compared to baseline. At the fourth week, the intervention group showed significantly better BBS and ATE than the control group ($P < 0.05$). By the eighth week, although there was no significant difference in BBS between the two groups ($P > 0.05$), the intervention group exhibited significantly better ATE than the control group ($P < 0.05$). **Conclusion:** Both therapy methods can effectively improve balance after TKA. However, ankle exercise appears to achieve superior dynamic balance improvements after TKA.

Cross-Sectional Associations of Sedentary Behaviour and Physical Activity on Depressive Symptoms Among Overweight/Obese Adults in the U.S.: An isotemporal substitution approach

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Objectives: This cross-sectional study aimed to investigate the impact of substituting sedentary behaviour (SB) time with equivalent durations of walking/bicycling or moderate-to-vigorous physical activity (MVPA) on depressive symptoms among overweight/obese adults. **Methods:** The study included 18,344 overweight/obese adults from the National Health and Nutrition Examination Survey (NHANES) 2006–2018. Participants' physical activity (PA) levels were assessed using the Global Physical Activity Questionnaire (GPAQ). Depressive symptoms, encompassing overall, somatic, and cognitive domains, were evaluated using the Patient Health Questionnaire-9 (PHQ-9). The isotemporal substitution model, employing weighted multiple linear regression, was utilised to examine the association between SB substitution strategies and depressive symptom scores. **Results:** Analyses revealed that substituting 30 minutes/day of SB time with an equal duration of walking/bicycling or leisure-time MVPA was associated with lower PHQ-9 total scores ($\beta = -0.088$, 95% confidence interval [CI] = -0.129 , -0.047 ; $\beta = -0.160$, 95% CI = -0.185 , -0.134 , respectively) among overweight/obese adults. Additionally, cognitive depressive symptom scores ($\beta = -0.035$, 95% CI = -0.058 , -0.013 ; $\beta = -0.074$, 95% CI = -0.088 , -0.060) and somatic depressive symptom scores ($\beta = -0.053$, 95% CI = -0.075 , -0.030 ; $\beta = -0.085$, 95% CI = -0.100 , -0.071) were lower with SB substitution with either walking/bicycling or MVPA. **Conclusion:** These findings suggest that substituting SB time with walking/bicycling or leisure-time MVPA could potentially reduce depressive symptoms in overweight/obese adults.

The Effect of Physical Activity on Social Skills and General Well-Being in Tibetan Adolescents

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Objectives: This study aimed to assess the prevalence of physical activity among Tibetan adolescents and its association with their social skills and overall well-being. The objective was to provide insights for improving efforts to promote physical fitness in this demographic. **Methods:** Using a 1% random sampling technique, 1,670 individuals were selected to participate in the survey, with 1,521 effectively completing it (validity rate: 91.1%). All participants reported good health without major illnesses. Assessment tools included the International Physical Activity Questionnaire (IPAQ) short form, the Adolescent Exercise Tendency Scale, and The Children's Self-Report Social Skills Scale (CS4). Descriptive statistics, analysis of variance (ANOVA), and regression analysis were employed for data analysis. **Results:** The study identified a concerning prevalence of underweight issues among Tibetan adolescents (18.3%). It also revealed a significant lack of physical activity, particularly in high-intensity exercises. Gender disparities were notable in social skills and competitiveness, with high-intensity physical activity significantly enhancing social skills and positively impacting overall well-being. Moderate-intensity exercise also contributed beneficially, albeit to a lesser extent. **Conclusion:** Tibetan adolescents encounter critical challenges related to physical condition and engagement in physical activity, with notable gender differences in social competencies. Addressing these issues is essential for their health and social development.

Effects of Walking with Deep Breathing Exercises on Mobility and Executive Function in Healthy Older Adults: A randomised controlled trial

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Objectives: Age-related declines in mobility and executive function significantly impact the independence and quality of life of older adults. Walking with deep breathing exercises (WDBE), derived from traditional Chinese health preservation techniques, has gained attention as a promising, non-invasive intervention. This study investigated WDBE's potential to improve both. **Methods:** A randomised controlled trial was conducted, involving 40 healthy male adults aged 65–70 years. Half of the participants were assigned to the WDBE group, while the remaining individuals comprised the control group. The WDBE group followed a structured 12-week program, engaging in sessions three times per week for 40 minutes each. Meanwhile, the control group maintained their usual lifestyle activities. Both groups underwent pre- and post-intervention assessments of mobility and executive function, including the Timed Up and Go test, the Stroop Color-Word Test, the 2-back Test, and the More-Odd Shifting Test. Statistical analysis was conducted using IBM SPSS Statistics for Windows (Chicago, IL, USA), with $P < 0.05$ considered statistically significant. **Results:** Compared to the control group, the WDBE group completed mobility and executive function tests significantly faster ($P < 0.05$) after the program. Importantly,

the accuracy of executive function tests remained consistent within the WDBE group ($P > 0.05$). Conversely, the control group did not exhibit any significant changes in outcome measures ($P > 0.05$). **Conclusion:** WDBE effectively improves mobility and executive function in healthy older adults. Further research is needed on long-term effects and broader applications (National Social Science Fund Project, NO.23BTY119).

Associations of Objectively-Measured Physical Activity and Sedentary Behaviour with Sleep Quality in Emerging Adulthood College Students

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Objectives: College students, as an emerging adulthood group, are particularly susceptible to experiencing shorter sleep duration and poorer sleep quality. Therefore, the primary objective of this study was to investigate the associations of physical activity and sedentary behaviour with sleep quality among college students. Additionally, the study aimed to explore the impact of substituting sedentary behaviour with physical activity on sleep quality. **Methods:** A total of 349 college students (mean age = 19.75 ± 0.85 , 57.6% females) were recruited from Shanghai, China. Light-intensity physical activity (LPA), moderate to vigorous-intensity physical activity (MVPA), and sedentary behaviour (SED) were objectively measured using the accelerometer (Axivity, AX3). Sleep quality was self-reported by the Pittsburgh Sleep Quality Index (PSQI). Two multiple linear regression models (single-factor model, and isotemporal substitution model) were conducted. **Results:** LPA and MVPA were positively associated with sleep quality ($P < 0.05$). Conversely, SED was negatively associated with sleep quality ($P < 0.05$). All models were adjusting for confounding factors including sex, age, mother's educational attainment, drinking behaviour, and accelerometer wear time. Furthermore, replacing 30 minutes of SED with 30 minutes of MVPA was significantly associated with a decrease in PSQI score ($B = -0.322$; 95% confidence interval = -0.624 – -0.021 ; $P < 0.05$) while holding total time constant. **Conclusion:** The findings indicated that PA was positively associated with sleep quality, while SED was negatively associated with sleep quality in emerging adulthood college students. Moreover, replacing sedentary time with an equivalent duration of MVPA exhibited a beneficial effect on sleep quality.

Monitoring Study on the Status of Scientific Fitness Literacy among College Students

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Objectives: To analyse the situation of scientific fitness activities among college students. **Methods:** A questionnaire survey, mathematical statistics, and other methods were used to collect 573 valid samples. All data were processed using SPSS 21.0. **Results:** 75% of college students preferred to work out in sports fields and parks, while the selection rate of gyms was 10.5%; 86.6% of students mainly participated in running and ball sports, and the participation rate of fitness and bodybuilding activities was 8.9%; in terms of the duration of exercise, 56.5% of students were in the range of 30–120 minutes, and 36.1% were less than 30 minutes; 65.8% of students did not exercise regularly, and only 17.1% had a regular programme. **Conclusion:** The places and methods of fitness activities among college students are relatively limited and lack regularity. This suggests that it is necessary to provide more diverse fitness options and promote the establishment of regular fitness programmes to improve the scientific fitness literacy of college students.

The Association of Fruit Consumption Behaviour with Muscle Endurance Among School-Aged Children in Indonesia: A cross-sectional study

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Objectives: School-aged children are significant assets for the advancement of the Indonesian nation. Encouraging healthy fruit consumption habits contributes to children's optimal growth and development, which can strengthen muscle endurance. Improved muscle endurance, in turn, prepares children for future phases of life, encompassing work and engagement in wholesome activities. This study aimed to determine the association of fruit consumption behaviour with muscle endurance among school-aged children in Indonesia. **Methods:** This cross-sectional study utilised secondary data from the South-East Asian Nutrition Surveys (SEANUTS) II Indonesia in 2019. The subjects of this research were 977 school-aged children throughout Indonesia. Fruit consumption behaviour was assessed using the Child Food Habit Questionnaire, while muscle endurance was evaluated using the number of sit-ups in 30 seconds. **Results:** Among the 448 boys and 589 girls, mostly aged 11 surveyed in Indonesia, most consume fruit three days per week and one portion daily. They have an average number of sit-ups of 12.40 times per 30 seconds. Multivariate analysis with multiple linear regression found that after adjusting for age and sex, the frequency of days/week fruit consumption ($P = 0.260$) is not associated with muscle endurance. Meanwhile, the portion of daily consumed fruit ($\beta = -0.783$; $P = 0.003$) is associated with muscle endurance. **Conclusion:** The portion of fruit consumed daily is associated with muscle endurance after being adjusted for confounding factors. Therefore, fruit consumed in any portion daily is significant for muscle endurance among school-aged children in Indonesia. Further research is required to understand the association better.

Sleeping Patterns of Youth Soccer Athletes

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Objectives: High-intensity training and games are crucial for athletes, requiring recovery to prevent injury. Sleep is essential for this recovery process, and poor sleep and fatigue increase the risk of injury in child and adolescent soccer athletes. While the effect of sleep quality and quantity on injury incidence is inconsistent, there's a trend towards increased injuries in athletes with poor sleep quality. This study aims to explore the relationship between athletes' sleeping habits and injury rates to inform further research and suggest potential adjustments to reduce injury incidence. **Methods:** Using an impartial online form, the sleep quality and duration of 83 youth athletes

were evaluated using the Athlete Sleep Screening Questionnaire (ASSQ). The ASSQ Sleep Difficulty Score Scoring Key and Modifiers were used to assess the outcome. **Results:** The study found that 28.9% of young athletes experienced mild sleep problems, while 71.1% had no issues. Additionally, 14.5% experienced sleep-related breathing disorders, 13.3% had trouble sleeping while travelling, and 14.5% had performance issues. These young athletes were not night-time types. The results showed no significant correlation between sleep difficulty ($P = 0.096$), sleep-disordered breathing ($P = 0.683$), sleep problems during travel ($P = 0.197$), performance problems ($P = 0.368$), or chronotype ($P = 0.655$) on injury incidence. **Conclusion:** The study involving 83 young athletes found no significant correlation between injury incidence and sleep behaviours, including sleep difficulty score, sleep-disordered breathing, and performance issues while travelling. These findings contradict previous research, possibly due to the cross-sectional methodology, small sample size, high bias from questionnaires, and a brief three-month research period. However, it's important to note that athletes with sleep problems do exist, requiring careful interpretation of the data.

Study on the Correlation Between Static Balance Ability and Cognitive Function in Elderly People

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Objectives: Falling not only poses significant physical health risks to older adults but also has a profound negative impact on their psychological well-being, imposing substantial caregiving stress and economic burden on individuals, families, and society. Balance ability is one of the key factors influencing the risk of falls among older adults. This study aims to make theoretical preparations for preventing falls by exploring the correlation between static balance ability and cognitive function in elderly people. **Methods:** Forty healthy elderly individuals aged 55–70 years old from Beijing Sports University, with normal cognitive function, were selected. Static balance ability was measured using the Prokin balance test in four states of standing on one foot, while cognitive function was assessed using the spatial memory span test and the simple reaction time test. Pearson correlation analysis was performed to study the correlation between static balance ability and cognitive function using SPSS 27.0 software. **Results:** The simple reaction time of elderly individuals was found to be related to the length of single-leg eye-opening movement ($r = 0.493$; $P = 0.027$). **Conclusion:** In the elderly population at Beijing Sports University, there exists a correlation between static balance ability and cognitive function. A significant correlation was observed only with reaction time, while a slight correlation was found with memory capacity.

Healthy Ageing and Physical Activity: A narrative review

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Objectives: Previous studies have demonstrated that physical activity enhances the quality of life and life expectancy among older individuals. This review aims to elucidate the role of physical activity in promoting healthy ageing, providing insights for future research in this area. **Methods:** This review clarifies the concept of healthy ageing by examining empirical articles concerning physical activity and healthy ageing. It identifies the pathways and conditions through which physical activity contributes to healthy ageing. **Results:** Physical activity helps older adults mitigate physiological changes, lower disease risk, and enhance physical fitness. It also boosts self-efficacy, accomplishment, and self-esteem, fostering a more positive emotional state among older individuals. Furthermore, it encourages their engagement in social activities, enabling them to become active contributors to society. However, not all levels of physical activity have a significant impact on healthy ageing; a certain intensity level is required for positive effects. Moreover, the age at which regular physical activity is initiated can influence its impact on healthy ageing. **Conclusion:** The beneficial effects of physical activity on healthy ageing have been consistently demonstrated. Nevertheless, there remains a lack of clear consensus on the definition of healthy ageing, with inconsistent assessment indicators and poor comparability between studies. Addressing these issues is essential for the standardisation and advancement of research on the relationship between healthy ageing and physical activity.

Investigating Physical Activity Behaviour Among High-School Students in China through the Integrative Behaviour Change Model (IBCM) Approach

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Objectives: The decline in physical activity among children and adolescents, once common in Western contexts, has now affected the Chinese demographic due to rapid economic and lifestyle changes. This trend underscores the importance of regular exercise for youth health and addressing sedentary behaviours. This study aimed to use the Integrative Behaviour Change Model (IBCM) to examine factors influencing physical activity behaviour in high-school students in China. **Methods:** 922 high-school students from Heilong Jiang province, China, participated in the study. They completed the IBCM questionnaire, which integrates components from Self-Determination Theory (SDT) and the Theory of Planned Behaviour (TPB) to understand their intentions, motivations, and behaviours. **Results:** The findings revealed deficiencies in current physical fitness standards among Chinese adolescents ($P < 0.05$) in all areas, highlighting the critical need for interventions to promote active lifestyles. **Conclusion:** Exploring the IBCM constructs, including autonomous motivation, attitudes, subjective norms, perceived behavioural control, and action planning, provided a comprehensive understanding of intention-behaviour dynamics. By addressing the intention-behaviour gap, this study illuminated effective strategies for enhancing physical activity engagement among high-school students, ultimately fostering improved health outcomes and overall well-being.

Effect of Shoulder Stability Training Methods in University Swimmers

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Objectives: Swimmers often face the risk of shoulder joint injuries due to prolonged training. This study aimed to explore the impact of 12 weeks of stability training on shoulder stability performance among university swimmers. **Methods:** Eighteen swimmers from Beijing Sports University were randomly divided into three intervention groups: Shoulder Sphere, dumbbell, and elastic band. Data

analysis involved paired T-tests, one-way ANOVA, and Pearson correlation coefficient. **Results:** Upper limb stability tests indicated that stability training methods enhanced shoulder joint stability, with the most significant improvement observed in the Shoulder Sphere group. Proper shoulder relaxation and stretching using PNF techniques helped maintain shoulder joint flexibility during stability training. Subjective feedback from swimmers regarding their shoulder joint significantly improved post-stability training. There was no significant difference in the internal/external rotation muscle strength ratio index, underscoring the importance of shoulder stability. Pearson correlation coefficient analysis revealed no correlation between the internal/external rotation muscle strength ratio and swimming performance. **Conclusion:** Stability training enhances shoulder muscle strength balance, particularly with Shoulder Sphere training. Employing appropriate relaxation and stretching techniques is crucial. Although stability training does not directly impact swimming performance, it enhances swimmers' proprioception.

Insights into Elite Asian Men's Hammer Throw: A temporal biomechanical analysis

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Objectives: This study aimed to conduct a descriptive biomechanical analysis of temporal stance parameters and the rotational velocity of the hammer among finalists in the 25th Asian Athletics Championships. **Methods:** All 14 throwers in the men's hammer throw final event were included. Throwing attempts were recorded using a camcorder (frame rate: 100 fps, shutter speed: 1/1,000s, resolution: 1,920 × 1,080 pixels) from the rear. Duration of single and double leg support during rotation and the hammer's rotational velocity were quantified using video analysis software. A full rotation was defined as a complete 360° azimuthal rotation about the thrower's body. **Results:** The mean accumulated ground contact time was 1.188 ± 0.086 s for single-leg support and 1.132 ± 0.083 s for double-leg support. For single-leg support, the mean time for turns 1 to 4 was 0.346 ± 0.035 s, 0.293 ± 0.024 s, 0.279 ± 0.023 s, and 0.271 ± 0.026 s, respectively. For double-leg support, the mean time for turns 1 to 4 was 0.378 ± 0.048 s, 0.265 ± 0.030 s, 0.224 ± 0.021 s, and 0.265 ± 0.023 s, respectively. The mean hammer's angular velocity was 500.0 ± 35.9°/s, 635.2 ± 33.1°/s, 716.5 ± 28.4°/s, and 751.5 ± 27.6°/s for turns 1 to 4, respectively. The mean gain of hammer's angular velocity was 135.1 ± 22.7°/s, 81.4 ± 12.6°/s, and 34.9 ± 10.6°/s for turns 2, 3, and 4, respectively. **Conclusion:** High last-turn rotational velocity emerged as a crucial performance factor, with the top five throwers exceeding 760.0°/s. Temporal trends in both single and double-leg support play important but opposite roles in gaining rotational velocity. Medallists generated higher rotational velocity gains in turns 3 and 4 but not in turn 2. Understanding these factors could contribute to optimising hammer throw performance.

Influences of Normobaric Hypoxia and Acute Exercise Modalities on Perceptual Responses in Adults with Overweight

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Objectives: Exercise adherence can be affected by sensations during or after physical activity, potentially leading to reduced enjoyment, especially at higher intensities among overweight individuals. Hypoxic conditioning may induce physiological changes and affect exercise adherence. This study aims to explore how combining different exercise modalities with moderate hypoxia (MH) influences perceptual measures and the Physical Activity Enjoyment Scale (PACES) in overweight adults. **Methods:** Ten overweight males (mean age: 32 ± 4 years; mean body fat: 27.8 ± 3.6%) completed three exercise trials in randomised crossover order: 60 minutes of endurance cycling at 90% lactate threshold (LOW), sprint interval training (20 × 4 s all-out against a load equivalent to 7.5% body weight; total of 40 minutes; SIT), and functional bodyweight exercises (8 sets of 4 × 20 s half-squat, gluteal contractions, calf raises, knee raises; total of 31 minutes; FEX) under MH (FiO₂ = 16.5%). PACES and perceptual measures (1–10 Borg Scale) were recorded during the exercises. PACES and perceptual measures among exercise modes under MH were analysed using one-way repeated-measures ANOVA. **Results:** Overall perceived discomfort, breathlessness, and limb discomfort were greater in SIT compared to LOW and FEX (35–55 ± 9–118%; *P* < 0.01). PACES scores did not differ between exercise modes; however, SIT and FEX exercises (111 and 113 points) scored higher than LOW exercise (101 points). **Conclusion:** In overweight adults, both SIT and FEX exercises were well-tolerated, equally enjoyable, and preferred. This suggests that shorter, moderate hypoxia exercises are more enjoyable and time-efficient compared to LOW. This should be considered when prescribing exercises to maintain enjoyment and adherence.

Relationship Between Fundamental Movement Skills and Screen-Based Sedentary Behaviour and Family Sports Environment in Early Childhood

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Objectives: Fundamental movement skill (FMS) development in early childhood is influenced by factors such as family environment and screen-based sedentary behaviour. However, there is limited comprehensive research on these environments. This study aims to investigate the relationship between FMS, screen-based sedentary behaviour, and family sports environment among preschoolers. **Methods:** The TGMD-3 was used to assess FMS ability in preschoolers, while the Preschool Screen Time Questionnaire (PSTQ) and the Family Physical Activity Environment Questionnaire (FPAEQ) were used to measure screen time and family sports environment, respectively. Two hundred preschoolers (aged 3–6) from Shanxi Province participated in the study. Data were analysed using correlation analysis, regression analysis, and interaction effect analysis. **Results:** The findings indicate a significant positive correlation between physical activity duration and FMS improvement (*r* = 0.65; *P* < 0.001). Regression analyses reveal that each additional hour spent on screens results in a 0.4 unit decrease in FMS scores (*β* = -0.4; *P* < 0.01). However, within supportive family sports environments, children's FMS development shows resilience even with increased screen time (*β* = 0.3; *P* < 0.05). **Conclusion:** The research highlights that supportive home environments enhance children's movement skills through physical activity, whereas excessive screen time impedes FMS development. Future studies should focus on high-quality interventions that promote FMS by encouraging family engagement and reducing screen time.

Exploring the Influence of Menstruation on Psychological Factors and Sport Performance Among Chinese Amateur Endurance Females

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Objectives: The association between menstruation, health, well-being, and athletic performance is a significant area of investigation. This study delves into the effects and perceptions of menstruation on sport psychology among Chinese amateur endurance athletes. **Methods:** Employing a mixed-methods approach, this study combines quantitative and qualitative methodologies to examine how menstruation influences psychological factors in women engaging in exercise. Amateur female athletes completed questionnaires featuring the Sport Motivation Scale-6 and the Sport Anxiety Scale (SAS), with 200 valid responses collected for analysis. Furthermore, semi-structured interviews with twelve randomly chosen participants provided deeper insights into the reasons behind heightened anxiety and decreased motivation in women. **Results:** Questionnaire results indicated a significant increase in exercise anxiety among women experiencing menstruation ($P < 0.05$) compared to non-menstruating women. Semi-structured interviews revealed that athletes often experienced symptoms such as sleepiness and gastrointestinal discomfort during menstruation. However, concerns about the potential impact of menstruation on exercise performance led to reduced expectations and motivation for physical activity among these individuals. Additionally, participants believed that engaging in high-intensity sports or games during menstruation could be detrimental to their health, contributing to the decline in their sport motivation. **Conclusion:** The findings highlight that menstruation significantly impacts women's sport psychology, affecting anxiety levels, motivation, concentration, and performance expectations. Coaches and sports science researchers can help mitigate these effects through strategies such as educating athletes about the physiological changes associated with the menstrual cycle and providing psychological training.

Evaluating Growth Dynamics: SCFE diagnosis in sports medicine clinics

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Objectives: This case aimed to assess the growth dynamics and diagnose slipped capital femoral epiphysis (SCFE) in adolescents presenting with hip pain in sports medicine clinics. **Methods:** A 12-year-old boy with atraumatic left groin pain, recent rapid growth, and early signs of puberty was evaluated. Initial examination suggested inguinal insufficiency, but subsequent assessments revealed a Trendelenburg gait, limited hip internal rotation and flexion, and positive Drehmann sign. Imaging studies, including pelvis x-ray and MRI of the hip joint, were conducted to confirm the diagnosis. **Results:** The MRI demonstrated features consistent with acute-on-chronic SCFE, including joint effusion, anteriorly positioned metaphysis, physeal widening, and inter-physeal oedema. Plain radiograph also showed asymmetry in Klein's line trajectory. The patient underwent percutaneous in-situ fixation and is being assessed for hypergonadism. **Conclusion:** Integrating SCFE diagnosis within sports medicine is crucial, as it can mimic other musculoskeletal-related conditions. This case underscores the importance of considering SCFE in adolescents with hip pain, especially during growth spurts, to prevent potential complications like avascular necrosis and long-term disability.

Combined Effects of Turmeric Supplementation and Strengthening Exercises on Physical Function Among Knee Osteoarthritis Patients

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Objectives: Knee Osteoarthritis is a prevalent condition within our community, often leading to reduced physical activity due to associated pain. Recent research indicates that engaging in knee-strengthening exercises can enhance physical function in individuals with knee OA. Turmeric supplementation has been found to possess pain-relieving properties, potentially contributing to improved physical function indirectly. This study aims to determine the effects of combining turmeric supplementation with strengthening exercises on the physical function of knee osteoarthritis patients over a 12-week intervention period. **Methods:** A double-blinded, placebo-controlled randomised control trial, with pre-test, mid-test, and post-test measurements, was conducted from November 2022 to April 2023. Thirty-six knee osteoarthritis patients were recruited and randomly assigned to two groups: the PE group ($n = 18$) and the TE group ($n = 18$). Participants in the PE group engaged in strengthening exercises (3 times per week) alongside placebo intake (1 capsule daily), while those in the TE group performed the same exercises (3 times per week) alongside turmeric supplementation intake (1 capsule daily). Physical function was assessed using the 6-minute walking test (6MWT) and WOMAC Physical Function Score. **Results:** Both the WOMAC and 6MWT demonstrated a significant improvement in physical function in the TE group across pre-test, mid-test, and post-test assessments ($P < 0.001$). **Conclusion:** The combination of turmeric supplementation and strengthening exercises resulted in a greater improvement in physical function compared to strengthening exercises alone. Thus, turmeric supplementation may be recommended for enhancing physical function in knee osteoarthritis patients.

Relationship between Peer Support, Motor Skills, Teachers' Response and Bullying Victimisation in Physical Education Among Chinese Adolescents

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Objectives: Bullying behaviour in physical education (PE) settings can deter students' participation. Understanding the interplay between peer support, motor skills, teachers' responses, and bullying is essential for devising effective strategies to foster a positive PE environment and address the negative impacts of bullying. This study aims to explore the relationship between peer support, motor skills, teachers' responses, and bullying victimization among Chinese adolescents in the context of PE. **Methods:** A convenience sampling approach surveyed 900 participants in Changzhou, China. Data analysis utilised multiple regression analysis. **Results:** Multiple regression analysis revealed significant negative associations of Peer Support ($\beta = -0.258$; $P < 0.001$), Motor Skills ($\beta = -0.197$; $P < 0.001$), and Teachers' Responses ($\beta = -0.081$; $P < 0.01$) with Bullying Behaviour, with Peer Support exhibiting the most substantial impact. Furthermore,

gender and BMI emerged as significant predictors of bullying behaviour, with females demonstrating lower levels of bullying compared to males. **Conclusion:** Peer support, motor skills, and teachers' responses significantly influence bullying behaviour within the PE context among adolescents. These findings underscore the importance of fostering supportive peer relationships, enhancing motor skill development, and implementing effective teacher interventions to address bullying among adolescents.

Taiwanese Physicians' Prescribing Habits and Anti-Doping Knowledge on Glucocorticoids in Sports

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Objectives: This study aims to delineate the prescription practices and comprehension of WADA regulations and Therapeutic Use Exemption (TUE) pertaining to Glucocorticoids (GCs) among physicians in Taiwan. **Methods:** An online survey, conducted via the SurveyCake platform, was disseminated through communication apps and social media to physicians practising in Taiwan and treating athletes. The survey queried physicians' prescribing practices of GCs and assessed their awareness of WADA's TUE regulations. **Results:** The questionnaire received 1,113 responses, achieving a response rate of 24.6%. After excluding non-physicians or physicians not treating athletes, 246 responses were analysed. Respondents, predominantly male (76.8%), had an average age of 50 ± 11.5 years. Specialisations included 64 (26%) in rehabilitation, 48 (19.5%) in orthopaedics, and 134 (54.5%) in other fields. Of these, 115 (46.7%) administered GC injections, primarily targeting soft tissues such as tendons and bursae, with triamcinolone acetonide being the most commonly used. Among physicians administering soft tissue injections, one-third administered them 7 days before athletes' competitions if a TUE was required. However, only one-tenth correctly identified that all injectable GCs necessitate TUE application. Additionally, 41% administered GCs non-invasively, primarily orally. The majority of athletes treated were second-level players (112, 45%), with reported side effects from GC injections/oral corticosteroids including infection and fluid retention. **Conclusion:** This study enhances understanding of GC prescription patterns among physicians in Taiwan and underscores the need to reinforce physicians' education on regulatory compliance regarding TUE application for GC utilisation, as mandated by WADA.

The Effect of an Eight-Week Transcranial Direct Current Stimulation Training on Pull-Up Performance in Healthy Male College Students

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Objectives: Pull-ups pose a challenge for many students during National Physical Fitness Tests. Transcranial direct current stimulation (tDCS) has previously shown promise as a training tool, enhancing muscular strength and endurance. This study aims to investigate the effects of tDCS on pull-up performance. **Methods:** Thirty-two healthy male college students participated in an 8-week training programme, with 15 in the tDCS resistance training (tRT) group (age: 19.20±1.15 yrs) and 17 in the conventional resistance training (CRT) group (age: 18.65±0.79 yrs). Participants in the tRT group wore Halo Sports headphones to stimulate the M1 region of the brain at an intensity of 2 mA for 20 minutes before each training session. Pull-up endurance (number of repetitions) and lat pull-down maximal voluntary isometric contraction (MVIC) peak force were measured before and after the training. Statistical comparisons were conducted using 2-way repeated measures ANOVA (2 training groups [tRT versus CRT] × 2 times [pre- versus post-training]). **Results:** The main effect of training time revealed significant increases in pull-up endurance (168%; $P < 0.001$) and lat pull-down MVIC force (25.6%; $P < 0.001$) after 8 weeks of training compared to pre-training in both the tRT (pull-up endurance: 2.53 ± 1.73 versus 6.8 ± 2.91; MVIC force: 646.54 ± 150.52 versus 820.13 ± 94.19 N) and CRT (pull-up endurance: 2.18 ± 1.91 versus 5.82 ± 3.36; MVIC force: 621.84 ± 123.75 versus 773.91 ± 121.36 N) groups. However, no significant interactions were observed in pull-up endurance and MVIC force. **Conclusion:** The notable improvements in pull-up endurance and MVIC force seem attributable to the effect of training time, with no significant enhancement observed from tDCS on pull-up strength and endurance.

Analysing Trends and Hotspots in High-Intensity Interval Training Research: A bibliometric and visualisation study (2014–2023)

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Objectives: This study conducts a systematic literature review on High-Intensity Interval Training (HIIT) using the Web of Science core database from 2014 to 2023. The objectives are to monitor publication trends, explore disciplinary distributions, and identify research focuses and emerging areas through keyword and cluster analysis. The aim is to highlight HIIT's interdisciplinary potential for health enhancement and disease prevention. **Methods:** Employing a mixed-methods approach, this study combines quantitative analyses with bibliometric, statistical, and visualization techniques. Using CiteSpace for literature review, the research analyses trends, disciplines, keyword occurrences, and thematic clusters within the selected database. The focus is on articles in English to ensure data comprehensiveness and precision. **Results:** The findings reveal a significant increase in HIIT research, from 27 publications in 2014 to 320 in 2023, totaling 1734 articles across 101 disciplines. Predominantly, research is in sports science (38.7%), physiology (22.0%), and nutrition-dietetics (7.0%). Cluster analysis using the Log-Likelihood Ratio (LLR) algorithm identified 10 significant clusters, with a modularity Q value of 0.5182 and a silhouette S value of 0.7877, indicating distinct research themes and strong within-cluster cohesion. **Conclusion:** HIIT has emerged as a significant mode of exercise intervention with wide-ranging potential applications in improving individual health and addressing specific health issues. Its growing body of research within sports science spans various disciplinary fields, showcasing its interdisciplinary impact. Furthermore, focal points of research and cluster analysis indicate that future studies are likely to explore HIIT's role in chronic disease prevention and treatment, quality of life enhancement, and mental health improvement, in line with academic rigor.

Changes in Strength Performance of High-Level Athletes After Coronavirus Disease 2019

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Objectives: This study investigates the impact of COVID-19 on athletes' strength performance. **Methods:** Prior to COVID-19, 108 athletes from Shanghai underwent tests for squat jump (SJ), counter-movement jump (CMJ), drop jump (DJ), and Isometric Mid-thigh Pull (IMTP). Subsequently, 27 infected athletes (age: 20.5 ± 2.3 years, height: 177.9 ± 7.2 cm, weight: 67.8 ± 10.6 kg, training age: 8.5 ± 1.6 years) underwent three tests post-recovery. The first test occurred approximately one week post-recovery, followed by a second test two weeks post-recovery. The third test took place four weeks post-recovery. No training was undertaken during the infection period and one week post-recovery. Subsequently, low-intensity endurance training was performed in the second week post-recovery, followed by low-intensity strength and specific training in the third week. Moderate-intensity endurance, strength, and specific training commenced in the fourth week post-recovery. A one-way repeated measurement ANOVA compared test indicators across different time points, with a significance level set at $P < 0.05$. **Results:** One week post-recovery, SJH (-7.71% ; $P = 0.005$), CMJH (-9.08% ; $P < 0.001$), DJRSI (-28.88% ; $P < 0.001$), MIS (-18.95% ; $P < 0.001$), RFD 0–50 (-64.98% ; $P < 0.001$), and RFD 0–100 (-53.65% ; $P < 0.001$) were significantly lower than pre-infection levels. Four weeks post-recovery, SJH (-2.08% ; $P = 0.236$), CMJH (-3.28% ; $P = 0.277$), and MIS (-3.32% ; $P = 0.174$) showed no statistically significant difference from pre-infection levels. However, DJRSI (-11.24% ; $P = 0.013$), RFD 0–50 (-31.37% ; $P = 0.002$), and RFD 0–100 (-18.99% ; $P = 0.001$) remained significantly lower than pre-infection levels. **Conclusion:** Post-COVID-19, athletes experienced a notable reduction in maximum strength, explosive strength, reactive strength, and initial force generation. Four weeks post-recovery, maximum strength and explosive strength returned to near pre-infection levels. However, reactive strength and initial force generation remained significantly lower than pre-infection levels.

The Effects of Bodyblade Training on Shoulder Strength and Proprioception in Adolescent Male Volleyball Players

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Objectives: This study aimed to investigate the impact of four weeks of Bodyblade exercise training on shoulder joint proprioception and muscle strength in adolescent male volleyball players. **Methods:** Sixteen male volleyball players (age: 17.21 ± 1.36 years, height: 193.07 ± 4.44 cm, weight: 77.93 ± 8.03 kg, SPADI = 0) participated in the study. The Bodyblade exercise training protocol involved using a vibrating bar on the dominant shoulder, with one-minute sets, three sets per session, and twice a week. Maximum peak torque of the dominant shoulder's external rotation at 90° abduction was measured using the Iso-med2000 test at a velocity of $60^\circ/s$. Joint position proprioception of the dominant shoulder was assessed at 90° abduction, with internal rotation at 60° and external rotation at 30° , using the Iso-med2000 test. Strength perception to replicate 25% of the maximum isometric strength of the dominant shoulder was evaluated using the Iso-med2000. Changes in upper limb dynamic balance before and after intervention were assessed by the Upper Limb Y Balance Test. **Results:** The average internal rotation isokinetic muscle strength increased from 47 ± 14.04 Nm to 50.44 ± 16.09 Nm after the intervention. The maximum peak external rotation moment decreased from 35.06 ± 10.04 Nm to 33.63 ± 12.27 Nm. The sense of position errors for external rotation at 30° and internal rotation at 60° also significantly improved. The errors of JPS30°ER decreased from $2.06 \pm 1.48^\circ$ to $1.48 \pm 0.87^\circ$, and the errors of JPS60°IR decreased from $2.5 \pm 1.69^\circ$ to $1.29 \pm 0.6^\circ$. The error of power sense for internal rotation increased from 1.72 ± 1.6 Nm to 2.30 ± 1.68 Nm, while the errors of power sense for external rotation increased from 2.56 ± 3.04 Nm to 3.61 ± 3.22 Nm. Y balance test scores on the dominant side improved from 90.25 ± 15.44 to 96.65 ± 12.02 . **Conclusion:** Four weeks of Bodyblade exercise training led to significant improvements in shoulder joint position proprioception and internal rotation isokinetic muscle strength in adolescent male volleyball players.

Study on the Effect of "multi-ball+ Game" Table Tennis Training on Children from 8 to 10 Years Old

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Objectives: This study aimed to examine the effects of "multi-ball + game" table tennis training on the sports characteristics and skills of 8-10-year-old players. **Methods:** The research employed various methodologies, including literature review, expert interviews, field investigations, questionnaire surveys, experimental methods, and mathematical statistics. **Results:** The "multi-ball + game" training significantly improved the young participants' interest in table tennis, unlike traditional multi-ball training, which showed no significant change in participation. The stability of basic technical skills improved markedly under the "multi-ball + game" approach, with significant differences noted compared to traditional training. Additionally, the 8-week "multi-ball + game" training enhanced agility, speed, explosive power, and ball sense more effectively than traditional methods. **Conclusion:** The comparative analysis of various data indicates that "multi-ball + game" table tennis training has a more substantial impact on the fundamental skills, special qualities, and interests of 8-10-year-old children compared to traditional training methods.

Enhancing Young Athletes' Psychological Well-Being from Coach-Athlete Relationship: A systematic review

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Objectives: This study aimed to explore the mechanisms through which the coach-athlete relationship (CAR) affects the psychological well-being (PWB) of young athletes and to summarize these mechanisms. **Methods:** A systematic review was conducted using an electronic literature search of the EBSCOhost SPORTDiscus database, focusing on articles containing the terms "coach-athlete relationship," "youth athletes," and "psychological well-being." An analysis of these articles was performed to identify and summarize the specific mechanisms by which CAR influences the PWB of young athletes. **Results:** Four mechanisms were identified through systematic analysis: (1) CAR impacts sports satisfaction, which in turn affects the PWB of young athletes; (2) a positive CAR fosters

good relationships among peers, contributing to improved PWB; (3) skill development mediates the relationship between CAR and PWB, with effective CAR enhancing skills and reducing burnout; (4) the merits and experience of coaches influence young athletes' PWB indirectly. **Conclusion:** The review highlights the significant role of CAR in enhancing the PWB of young athletes through various mechanisms. These findings can inform strategies to develop positive CAR and improve PWB among young athletes.

The Sports Competition Rumination Scale: Psychometric properties of the Chinese version

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Objectives: This study aimed to translate and validate the Sports Competition Rumination Scale (SCRS) into Chinese, originally developed by Alena et al. (2023) to assess athletes' rumination during competitions. **Methods:** The translation process employed standard forward and backward translation procedures to ensure consistency with the original SCRS. A team comprising five experts in professional translation, sport psychology, and sports science conducted the translations. Confirmatory factor analysis (CFA) using Mplus 8 software was applied to validate the Chinese version of the SCRS. **Results:** The Chinese version of the SCRS retained all 8 items from the original scale, demonstrating strong consistency. The validation process yielded favorable fit indices, including RMSEA and SRMR, and the composite reliability ranged from 0.906 to 0.941, indicating high reliability. **Conclusion:** The Chinese version of the SCRS was validated with strong reliability and validity, making the 8-item scale a suitable tool for assessing rumination among athletes in China.

Analysing the Correlations Among Fundamental Movement Skills, Physical Fitness and Motivation in Preschool Children

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Objectives: This study aimed to investigate the relationships among fundamental movement skills (FMS), physical fitness (PF), and motivation in preschool children to inform early childhood physical education strategies. **Methods:** In a cross-sectional study involving 772 preschoolers aged 3-6, FMS were assessed using the Test of Gross Motor Development-3 (TGMD-3), focusing on locomotor and ball skills. PF was evaluated according to the Chinese Physical Fitness Test Standard (preschool version), measuring balance, flexibility, jumping, running, and throwing abilities. Motivation was assessed using the preschool physical literacy assessment questionnaire (pre-play). SPSS 26.0 and Pearson correlation coefficients were used to analyze significant correlations among FMS, PF, and motivation. **Results:** Significant positive correlations were found between the two FMS subdomains and various physical fitness indicators. Locomotor skills were strongly correlated with standing long jump ($r = 0.68$; $P < 0.01$) and 10m shuttle run ($r = 0.65$; $P < 0.01$), while ball skills had significant correlations with tennis ball toss ($r = 0.72$; $P < 0.01$) and continuous two-footed jump ($r = 0.70$; $P < 0.01$). Additionally, a positive correlation ($r = 0.55$; $P < 0.01$) between overall FMS levels and motivation indicated that higher skill levels are closely linked to greater motivation for physical activities. PF indicators, particularly walking the balance beam ($r = 0.60$; $P < 0.01$) and standing long jump ($r = 0.63$; $P < 0.01$), also showed strong positive correlations with children's motivation. **Conclusion:** The study highlights significant positive relationships between FMS, PF, and motivation in preschoolers, emphasizing the need for integrated approaches in early childhood education to support holistic development.

Psychometric Properties of the Chinese Version of Mindfulness Sport Performance Enhancement

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Objectives: This study aimed to translate the Mindfulness Sport Performance Enhancement (MSPE) scale, initially developed by Harita et al. (2022), into Chinese and validate its use for athletes. The original MSPE scale has demonstrated significant positive impacts on individual sports performance by aiding in performance evaluation and skill comprehension. **Methods:** The Chinese adaptation of the MSPE involved a rigorous translation process, including standard forward and backward translations to ensure fidelity to the original scale. A team of five experts, including professional translators and specialists in sport science and sport psychology proficient in both English and Chinese, performed the translations. The Chinese version was validated using confirmatory factor analysis (CFA) with Mplus 8.0 software. A total of 350 questionnaires were distributed, with 309 valid responses collected after excluding 18 invalid ones. **Results:** The Chinese version of the MSPE retained all 17 items from the original scale and demonstrated strong alignment. Favorable fit indices, including RMSEA and SRMR, confirmed the adequacy of the Chinese adaptation. Composite reliability ranged from 0.916 to 0.937, indicating high reliability. **Conclusion:** The validated Chinese version of the MSPE exhibited robust reliability and validity, making the 17-item scale suitable for use among athletes in China.

Correlation Study Between Attention Characteristics and Mental Fatigue of Rifle Shooters

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Objectives: This study aimed to investigate the psychological fatigue and attention characteristics of rifle shooters and to examine the relationship between them. **Methods:** Nineteen elite rifle shooters were recruited to participate in this study. Psychological fatigue was assessed using a questionnaire, while attention characteristics were measured using attention test scales. The study explored the relationship between attention concentration and psychological fatigue. **Results:** (1) No significant differences were found in emotional/physical exhaustion, reduced sense of accomplishment, and negative evaluation of sports between male and female rifle shooters ($P > 0.05$). Significant differences in emotional/physical exhaustion and sport devaluation were observed among shooters across different events, training years, and age groups ($P < 0.05$). (2) Attention characteristics did not significantly differ between male and female

rifle shooters ($P > 0.05$). Significant differences were noted in attention distribution and attention span among shooters with varying training years and ages ($P < 0.05$). Attention characteristics of shooters in different events were significantly correlated ($P < 0.05$). (3) Attention span was significantly correlated with attention transfer, and attention stability was significantly correlated with attention transfer. Negative evaluation of exercise was significantly correlated with emotional/physical exhaustion. No significant correlation was found between attention characteristics and mental fatigue. **Conclusion:** (1) There were no gender differences in mental fatigue and attention characteristics among rifle shooters. (2) As age and training years increased, psychological fatigue, attention span, and attention distribution also showed an increasing trend. (3) Shooters participating in multiple events demonstrated higher attention levels than those in single-caliber events, but they also experienced more severe psychological fatigue.

Unveiling Trends in Mental Health Research on Elite Sports: A bibliometric study

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Objectives: This study employed bibliometric analysis to investigate past and recent research patterns in mental health related to elite sports, and to forecast future research directions within this developing field of sports psychiatry. **Methods:** A bibliometric approach was used to analyze 521 scholarly articles from the Web of Science database, covering the period from 1992 to December 31, 2023. The study employed co-citation and co-word analyses to identify significant works, construct a knowledge framework, and predict emerging trends in mental health research related to elite sports. **Results:** Co-citation analysis revealed three primary clusters: (1) Mental health in elite sports: Prevalence, risk factors, and consequences; (2) Mental health in elite sports: Assessment, management, and intervention strategies; (3) Positive mental health and holistic well-being in athletes. Co-word analysis identified four clusters: (1) Athlete Mental Health and Identity; (2) Psychological Vulnerabilities and Coping Strategies in Athletes; (3) Mental Health Challenges and Support Mechanisms in Athletics; (4) Impact of COVID-19 on Athletes' Mental Health. **Conclusion:** The findings indicate that mental health research in elite sports is gaining significance, yet further studies are necessary to provide a more integrated perspective of the research field. This study offers valuable insights into the expanding domain of mental health research in elite sports and presents an outlook on future developments. Uniquely, it establishes a knowledge structure of mental health and elite sports using a science mapping approach.

A Successful Treatment of Tarsal Tunnel Syndrome Using Hydro-Dissection Technique: A case report

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Objectives: Tarsal tunnel syndrome (TTS) is a rare ankle disorder caused by compression of the posterior tibial nerve at the tarsal tunnel. This case report aims to describe a successful treatment of TTS using the hydro-dissection technique. **Methods:** A 41-year-old woman initially treated for severe ankle sprain developed moderate-to-severe medial ankle pain, neuropathic in nature, radiating to the big toe one-year post-injury. Clinical assessments revealed tenderness at the tarsal tunnel with a positive Tinel sign. Ultrasound examination confirmed an enlarged posterior tibial nerve at the tarsal tunnel level, with tenderness and reproducing symptoms on sono-Tinel sign. **Results:** Hydro-dissection of the posterior tibial nerve resulted in significant pain reduction and improved daily function. **Conclusion:** Prolonged bracing for ankle sprain can lead to nerve scarring and reduced nerve gliding, contributing to TTS. Ultrasound, particularly sono-palpation and sono-Tinel sign techniques, is effective in diagnosing TTS and identifying compressive factors in real-time. Hydro-dissection emerges as a minimally invasive treatment option with promising outcomes for TTS.

Symptomatic Relief in Chronic Shoulder Pain Among Sabah Badminton Players Following Prolotherapy: Case series of 15 players

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Objectives: Badminton, a high-intensity racquet sport, often leads to shoulder injuries due to repetitive overhead motions. Conservative treatments for chronic shoulder pain can take over two years to show improvement. This case series explores the effectiveness of prolotherapy injections in alleviating chronic shoulder pain among badminton players. **Methods:** Fifteen Sabah Badminton Association players aged 18–35 with chronic shoulder pain, diagnosed with rotator cuff tendinopathy and/or Superior Labral Anterior to Posterior (SLAP) lesions, received monthly injections of 5ml of 25% Dextrose solution over three months at the Sports Medicine Clinic, Queen Elizabeth Hospital. A rehabilitation program targeting shoulder and scapular muscle strengthening was also prescribed. Shoulder Pain and Disability Index (SPADI) scores were evaluated at baseline, 4 months, and 6 months post-prolotherapy using one-way repeated measures ANOVA in SPSS version 20. **Results:** Clinical diagnoses indicated that 87% ($n = 13$) of participants had both Rotator Cuff Tendinopathy and SLAP lesions. All 15 participants demonstrated significant improvement ($P < 0.001$) in mean SPADI scores compared to baseline: at baseline ($61.49 \pm 16.8\%$), 4 months ($26.38 \pm 13.5\%$), and 6 months ($2.08 \pm 1.25\%$). **Conclusion:** Dextrose Prolotherapy Injection combined with a structured rehabilitation and strengthening program shows promise in reducing shoulder pain and enhancing function, leading to accelerated recovery among badminton players suffering from chronic shoulder pain.

Recalcitrant Lateral Epicondylitis Treated with Ultrasound-Guided Leukocyte-Depleted PRP Injection Incorporating with Strengthening and Stretching Exercises: A case report

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Objectives: Platelet-rich plasma (PRP) injection is a debated treatment for lateral epicondylitis. This case report explores the effectiveness of ultrasound-guided leukocyte-depleted PRP (LP-PRP) injection combined with strengthening and stretching exercises. **Methods:** A 49-year-old woman, whose job involved heavy lifting, presented with left elbow pain persisting for two weeks. Clinical examination

revealed local tenderness at the lateral epicondyle and positive Cozen's and Maudsley's tests. Ultrasound showed hypoechogenicity at the common extensor tendon origin, confirming lateral epicondylitis. Initial conservative treatment with kinesiology taping and strengthening exercises showed no improvement after two months, with worsening work-related limitations. Subsequently, ultrasound-guided LP-PRP injection was administered, followed by resumption of strengthening and stretching exercises two weeks later. At two months post-injection, the patient reported being pain-free with no functional limitations, and ultrasound confirmed normal appearance of the common extensor tendon origin. **Results:** PRP injection promotes healing by releasing growth factors at the injury site. Studies comparing different PRP types in lateral epicondylitis have shown superior long-term effectiveness of leukocyte-depleted PRP and significant reductions in Visual Analog Scale (VAS) scores at 8- and 52-weeks post-injection. Combining PRP injection with physiotherapy has demonstrated better pain relief and functional outcomes compared to physiotherapy alone. **Conclusion:** This case illustrates complete resolution and functional recovery of recalcitrant lateral epicondylitis treated with ultrasound-guided LP-PRP injection, accompanied by strengthening and stretching exercises.

Sural Nerve Entrapment: A case report of lateral ankle pain in an athlete

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Objectives: This case report details a basketball player diagnosed with Sural Nerve Entrapment, presenting with lateral ankle pain and numbness. **Methods:** A 33-year-old basketball player presented with right lateral ankle and foot tingling pain and numbness persisting for two months. Initially treated for tendinopathy and underwent physiotherapy without improvement, the patient sought a second opinion at the Sports Medicine Unit, Queen Elizabeth Hospital. Symptoms exacerbated during intense training but resolved with rest. Examination revealed reduced pinprick sensation over the lateral malleolus and dorsum of the fifth metatarsal, with myofascial trigger points in the lateral gastrocnemius muscle. Radiological investigations were unremarkable. Conservative management was initiated, resulting in symptom resolution within three weeks, allowing the patient to return to play without complications. **Results:** Conservative treatment effectively resolved symptoms of Sural Nerve Entrapment in this athlete presenting with lateral ankle pain and numbness. **Conclusion:** Sural Nerve Entrapment should be considered in athletes experiencing lateral ankle pain and numbness, emphasizing the importance of timely diagnosis and appropriate conservative management.

Exercise Therapy for Long COVID Myocardial Injuries

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Objectives: Long COVID myocardial injury, attributed to factors such as ischemia and inflammation, significantly impairs cardiomyocyte function, thereby reducing patients' physical capacity and quality of life. Cardiac rehabilitation plays a critical role in restoring cardiopulmonary function in these individuals. This paper investigates the role of exercise rehabilitation in managing Long COVID myocardial injuries. **Methods:** Relevant literature was systematically collected from PubMed and Web of Science using keywords such as "COVID-19", "SARS-CoV-2", "myocardial injury", and "exercise rehabilitation". **Results:** (1) Continuous Aerobic Endurance Training: Essential for restoring cardiorespiratory fitness, continuous aerobic training facilitates adaptations in the heart, blood vessels, and skeletal muscles. Moderate-intensity continuous exercise is currently favored for its feasibility and cost-effectiveness. (2) Interval Training: Initially, interval training involves alternating between exercise and rest periods, gradually increasing intensity as endurance improves. Low-volume, high-intensity interval training (HIIT) enhances cardiorespiratory fitness more effectively than moderate-intensity training, although it requires stringent safety monitoring. (3) Resistance Training: Controversy surrounds resistance training in cardiac rehabilitation due to potential elevations in blood pressure and cardiac load, despite observed post-training reductions in blood pressure lasting up to 24 hours. **Conclusion:** Exercise rehabilitation programs aim to improve cardiopulmonary and myocardial function in Long COVID myocardial injuries. However, the absence of standardised guidelines necessitates further research for optimal clinical implementation.

The Importance of Adding Dry Needling as an Adjunct to Standard Rehabilitation in the Management of Osteitis Pubis in Athlete

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Objectives: Osteitis pubis, characterised by inflammation of the pubic symphysis, often manifests with groin pain and functional impairment. This abstract explores treatment modalities for osteitis pubis, emphasizing the role of dry needling as an adjunct therapy to enhance patient outcomes and facilitate return to sports. **Methods:** A 20-year-old athlete presented to a sports medicine clinic in May 2023 with complaints of right groin pain persisting for 2 months post-athletic event, exacerbated during sprint training (rest pain score 4, training pain score 6). Examination diagnosed osteitis pubis with concurrent right adductor longus and iliopsoas strain. Standard rehabilitation focused on exercises targeting iliopsoas, adductors, and core muscles was initiated. After 2 months with minimal pain improvement (pain score 4), dry needling was administered to quadriceps, iliopsoas, and adductor muscles at week 8. Subsequently, significant pain relief (pain score 1) was achieved after three dry needling sessions, enabling the athlete to return to sports without recurrence. **Results:** Incorporating dry needling accelerated patient recovery, facilitating prompt return to sports post-treatment. **Conclusion:** Dry needling serves as a beneficial adjunct in managing musculoskeletal pain such as osteitis pubis, demonstrating promising results in pain reduction and enhancing recovery timelines.

Integrated Injury Management in Athlete Rehabilitation: A case report

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Objectives: This study implemented an Integrated Injury Management (IIM) program for a 22-year-old national-level cricket fast bowler with chronic low back pain attributed to L4-L5 spondylolysis, aiming to evaluate program efficacy. **Methods:** The athlete received a 24-week tailored rehabilitation regimen, beginning with an epidural steroid pars block injection for acute pain management

guided by C-arm imaging. Subsequently, the rehabilitation included serial physiotherapy sessions and a customised graded Strength & Conditioning program focusing on posterior kinetic chain, core, and spinal muscle strengthening. Psychological interventions, including mood assessment, goal setting, and mind-to-muscle training utilising a proprietary biofeedback system, were supervised by a senior Sports Psychologist. Outcome measures encompassed pain scores, spinal and hamstring flexibility. **Results:** At the conclusion of the 24-week program, the athlete demonstrated pain-free spinal range of motion, improved hamstring flexibility, and enhanced strength in the posterior kinetic chain. Pain scores decreased from 6/10 to 3/10. The athlete reported increased confidence, improved mood stability, and a reinforced mind-body connection. Following successful completion of a return-to-sport assessment, the athlete resumed competitive participation. **Conclusion:** Integrated Injury Management, integrating psychological strategies alongside physical rehabilitation, offers a holistic approach to athlete recovery. This comprehensive method not only addresses physical injuries but also prioritizes athlete well-being, ensuring a safe return to sport. This underscores the importance of interdisciplinary collaboration in sports medicine for optimizing rehabilitation outcomes.

Hot-Compress and Low-Medium-Frequency-Electrotherapy Improves Pain, Proprioception and Joint Moment Among Elderly with Knee Osteoarthritis

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Objectives: This study aimed to investigate the effects of an 8-week intervention combining hot compress (TC) with low-medium frequency electrotherapy (LMFE) on pain, proprioception, and knee joint moment among elderly individuals with knee osteoarthritis (KOA). **Methods:** Twenty-nine elderly participants with KOA were randomly assigned to either the TC+LMFE group (n=15, mean age 69.4±2.8 years) or the TC group (n=14, mean age 69.1±2.0 years). The TC+LMFE group received combined TC and LMFE treatments three times per week, while the TC group received TC alone for the same duration. Pain was assessed using the Western Ontario and McMaster Universities Arthritis Index (WOMAC), joint proprioception was measured by position perception error at the affected knee joint angles (45° and 75°), and knee joint moment was recorded using a twelve-camera motion analysis system synchronised with force plates. Two-way ANOVA with repeated measures was used for data analysis. **Results:** Significant group-by-intervention interactions were observed for pain score ($P = 0.041$, $\eta^2p = 0.146$), 45° ($P = 0.047$, $\eta^2p = 0.138$) and 75° ($P = 0.012$, $\eta^2p = 0.213$) position perception error, and knee extension moment ($P = 0.005$, $\eta^2p = 0.260$). Post hoc comparisons indicated that both groups showed significant reduction in pain from baseline to week 9 (TC+LMFE: $P < 0.001$, effect size $d = 2.410$; TC: $P < 0.001$, effect size $d = 2.033$), with the TC+LMFE group demonstrating greater pain reduction compared to the TC group at week 9 ($P < 0.001$, effect size $d = 1.901$). Similarly, the TC+LMFE group showed decreased position perception errors at both 45° ($P = 0.007$, $d = 0.844$) and 75° ($P = 0.004$, $d = 0.746$), and increased knee extension moment ($P < 0.001$, $d = 0.927$) at week 9 compared to baseline. **Conclusion:** The 8-week TC+LMFE intervention was more effective than TC alone in improving pain, proprioception, and knee extension moment among elderly individuals with KOA. These findings highlight the potential benefits of combining TC with LMFE as a therapeutic approach for managing KOA in elderly patients.

Triumph over ACL Rupture with Conservative Rehab: A case report unveiling functional recovery

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Objectives: Anterior cruciate ligament (ACL) reconstruction is a common approach for managing ACL rupture in active individuals; however, conservative therapy offers a non-invasive alternative for those who cannot undergo surgery. This case report aims to evaluate the effectiveness of conservative management in a partial ACL rupture. **Methods:** A 21-year-old male football player presented with persistent discomfort in his right knee following a football-related injury. Pain, rated at 6 on the Visual Analog Scale (VAS), accompanied by swelling and bruising, compromised muscle strength (MMT score: 4-) and knee range of motion (ROM: flexion 120°, extension 10°). Due to pain, the patient experienced difficulty in activities like climbing stairs. Magnetic Resonance Imaging (MRI) revealed a partial ACL tear, horizontal meniscal tear, and joint effusion. **Results:** The patient underwent conservative therapy twice weekly for 24 sessions, which included cryotherapy, strengthening exercises, balance training, and range of motion exercises. After an 8-month follow-up, significant improvements were noted: the VAS score decreased to 1, muscle strength (MMT) restored to 5, and knee flexion ROM increased to 135° with full extension. The patient successfully returned to football and other activities. **Conclusion:** This case underscores the efficacy of conservative interventions in managing partial ACL ruptures. The comprehensive rehabilitation program facilitated substantial functional recovery, enabling the patient to resume sports and daily activities without instability. Conservative management can be a viable option in selected cases of ACL injuries, offering positive outcomes without surgical intervention.

Effect of Resonant Breathing Training on Left Ventricular Global Longitudinal Strain in Patients with Long COVID-related Myocardial Injury

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Objectives: Long COVID refers to persistent symptoms following COVID-19 infection recovery. This study explores the impact of resonant breathing training on global longitudinal strain (GLS), a key measure of cardiac function, in patients with Long COVID-related myocardial injury. **Methods:** Nineteen patients (mean age 38 ± 10.43 years) with Long COVID-related myocardial injury were enrolled. They underwent 4 weeks of resonant breathing training, consisting of sessions twice daily, with 3 sets per session and 8 breaths per set. Changes in GLS were assessed before and after the intervention using two-dimensional speckle-tracking echocardiography. **Results:** Before the intervention, the mean GLS was -14.36 ± 4.44%. After 4 weeks of resonance breathing training, the mean GLS significantly improved to -18.2 ± 4.11% ($P < 0.01$), indicating a 26.74% absolute improvement in GLS. **Conclusion:** Resonant breathing training demonstrated significant improvements in cardiac systolic function, as evidenced by enhanced GLS, in patients with Long COVID-related myocardial injury. Despite these promising findings, further research is necessary to establish clinical guidelines for incorporating resonant breathing training into rehabilitation protocols for Long COVID-related myocardial injury.

Systematic Review on Reasons for the Lack of Exercise in Obese Adults

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Objectives: This study aimed to investigate the primary reasons why obese adults remain sedentary despite recognising the complications associated with lack of exercise. **Methods:** A systematic review was conducted using the EBSCOhost SPORTDiscus (1941–2023) and Google Scholar (2004–2023) databases. Articles containing keywords such as "obese," "obesity," "adults," "exercise," and "lack," and including randomised control trials, controlled trials, and cohort studies, were identified. **Results:** Thirty-nine publications met the inclusion criteria. The studies identified physical injuries, discomfort while exercising, and self-consciousness about body image as significant barriers that diminish interest, confidence, and motivation for physical activities among obese adults. Additionally, factors such as time constraints and limited access to exercise facilities or space were reported to contribute to low levels of physical activity. Improving psychological well-being emerged as a crucial factor in enhancing motivation for exercise. The implementation of realistic exercise plans tailored for obese individuals was suggested to sustain higher levels of physical activity, thereby improving health and quality of life. **Conclusion:** Effective support systems are essential in addressing the inactive lifestyles of obese adults. Enhancing psychological well-being can positively influence their mindset and encourage participation in physical activities. Practical and feasible exercise routines tailored to obese adults could facilitate sustained engagement in physical activity. Moreover, educating family members about the benefits of physical activity could further support obese individuals in maintaining adequate exercise levels.

New Test Battery for Knee Functions in Healthy Females: A preliminary study

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Objectives: This preliminary study aimed to develop a new test battery for assessing knee function using the principles of the five repetitions test (5RT) in healthy females. **Methods:** Forty-two healthy females (age: 43.31 ± 15.634 years, height: 159.31 ± 6.127 cm, weight: 58.186 ± 11.458 kg) volunteered for the study. The test battery included two domains: Muscle Strength and Endurance Domain (MSED) with exercises including superman (SUP), hinge with calves raised (HCR), and squat with trunk rotation (STR); and Balance, Stability, and Coordination Domain (BSCD) including hip flexion with arm raised (HFAR) and hip and shoulder abduction (HSA) for both left and right sides. Participants performed these tests after a warm-up and familiarization phase, with retesting conducted within a 15-minute interval. **Results:** The average times for 5RT in seconds were as follows: SUP (7.086 ± 1.967), HCR (6.355 ± 1.294), STR (19.557 ± 4.132), HFAR-L (6.561 ± 1.150), HFAR-R (6.576 ± 1.089), HSA-L (5.994 ± 1.226), and HSA-R (6.094 ± 1.162). Correlation coefficient analysis demonstrated strong correlations ($CC > 0.80$), and Cronbach's alpha indicated strong internal consistency across all variables ($\alpha = 0.915$). **Conclusion:** The application of the 5RT principle in this new test battery provides a simple and efficient method for holistic assessment of knee function encompassing five fitness elements. Future research should expand the sample size and include a validity comparison group to further validate the efficacy of these tests.

The Effectiveness of Kinesiotaping on Dynamic Balance in Healthy Recreational Futsal College Athletes

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Objectives: Dynamic balance is crucial for performance and injury prevention in futsal, with poor balance linked to increased ankle injuries. This study aimed to investigate whether Kinesio taping (KT) could enhance dynamic balance in healthy recreational futsal athletes. **Methods:** Forty-four male recreational futsal athletes were randomly assigned to either an intervention group ($N = 22$, mean age: 19.5 ± 1.47 years) or a placebo group ($N = 22$, mean age: 20.18 ± 1.18 years). Participants with sensory disturbances, lower extremity muscle weakness (< 5 on MMT), or positive Romberg test were excluded. KT using the tendon correction method was applied to the extensor digitorum and extensor hallucis longus muscles in the intervention group, while non-elastic tape served as the placebo. Dynamic balance was assessed using the Star Excursion Balance Test (SEBT) composite score before and immediately after a 15-minute taping session. **Results:** Baseline data revealed no significant differences between the two groups. Post-test SEBT composite scores showed a significant inter-group difference favoring the KT group (KT: 63.58 ± 4.81 , confidence interval [CI]: 61.45–65.71; placebo: 57.09 ± 4.49 , CI: 55.10–59.08; $P < 0.001$). The mean difference in SEBT composite scores (delta) was significantly higher in the KT group compared to the placebo group (KT: 6.72 ± 1.62 , CI: 6.00–7.44; placebo: 0.26 ± 0.89 , CI: -0.13 – 0.66 ; $P < 0.001$). **Conclusion:** The application of KT significantly improved dynamic balance in healthy recreational futsal athletes compared to a placebo. Further research should explore the long-term effects and optimal protocols of KT application in sports settings.

Comparative Research on the Effect of Water and Land Fitness Walking on the Body Composition and Aerobic Capacity of Male College Students with Mild Obesity

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Objectives: This research aims to compare the effects of water and land fitness walking on the body composition and aerobic capacity of male college students with mild obesity. It addresses the gap in literature regarding aquatic versus land-based exercise interventions for managing obesity in this demographic. **Methods:** Thirty-six male college students were randomly allocated to water walking, land walking, or a control group. Participants engaged in exercise sessions three times per week for four weeks at moderate intensity. Statistical analysis utilised ANOVA to compare changes across groups. **Results:** Following the 4-week intervention, both the water walking and land walking groups showed significant improvements in VO_{2max} and lactic acid threshold ($P < 0.05$). The water walking group demonstrated superior performance compared to the land walking group ($P < 0.01$). Specifically, the water walking group exhibited significant reductions in body weight and BMI ($P < 0.05$), whereas these metrics remained unchanged in the land walking and control groups. Waistline and waist-hip ratio decreased significantly in both exercise groups ($P < 0.05$), with the water walking group also experiencing a significant reduction in thigh circumference ($P < 0.05$). Body fat percentage decreased significantly in both exercise

groups ($P < 0.05$), while muscle content and bone density showed no significant changes ($P > 0.05$). **Conclusion:** Water fitness walking appears to be more effective than land walking in improving body composition and aerobic fitness among male college students with mild obesity. These findings have implications for designing fitness programs in university settings. Future research should investigate the long-term effects and sustainability of these interventions.

Improving Shandong Province Preschool Children's Physical Literacy Through Play

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Objectives: This study aimed to assess the effectiveness of play-based educational interventions in enhancing physical literacy among preschool children in Shandong Province. **Methods:** A total of 154 participants (77 males, 77 females) aged 5 to 6 years were selected, with an equal number assigned to the experimental and control groups. Both groups underwent identical conditions except for the class content. Over a period of three months, a controlled experimental design was employed, implementing a pre-designed play-based curriculum. The curriculum was developed based on quantitative interviews, surveys, and a review of relevant empirical studies conducted by experts. Measurements included assessments of fundamental motor skills, physical health indicators, motivation, and enjoyment, which were subjected to further statistical analysis. **Results:** Analysis revealed low correlations among fundamental movement skills, physical fitness, motivation, and enjoyment, indicating their independence. Significant weak positive correlations were found between fundamental movement skills and motivation ($r = 0.121$, $P < 0.00001$) and physical fitness ($t = 3.38$, $P = 0.001$) in the experimental group compared to the control group. Moreover, significant differences were observed between the two groups in terms of motivation and enjoyment. **Conclusion:** This research enhances understanding of the role of physical literacy in early childhood development. It provides practical guidance for kindergarten teachers and principals in promoting children's health through physical education and active play within the curriculum. The findings offer theoretical insights into effective educational methods and approaches.

Impact of High-Intensity Interval Training on Physical Health and Sports Performance of University Badminton Players

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Objectives: This study aimed to evaluate the impact of high-intensity interval training (HIIT) on the physical health and sports performance of university badminton players, focusing on a comprehensive set of physical indicators beyond those traditionally studied. **Methods:** Two groups of badminton players from Yunnan Normal University were randomly assigned: an intervention group undergoing HIIT sessions every Monday, Wednesday, and Friday for one month, and a control group continuing regular physical training. **Results:** Following the intervention, significant differences were observed between the intervention and control groups: (1) Weight index showed a significant increase in the intervention group (mean = 71.8; $P = 0.001$) compared to the control group (mean = 69.1; $P = 0.01$), while height index exhibited no significant difference (mean = 1.71; $P > 0.05$). (2) Regarding physical function, vital capacity significantly improved in the intervention group (mean = 4072; $P = 0.001$) compared to the control group (mean = 4030; $P > 0.05$). **Conclusion:** HIIT proved effective in enhancing the physical health and sports performance of university badminton players, demonstrating significant improvements in weight management, vital capacity, and specific badminton skills. These findings underscore HIIT's efficacy as a beneficial training strategy for optimizing overall physical and athletic performance among student-athletes.

Body Composition and Injury Among Malaysian Professional Football Players

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Objectives: This study investigates the relationship between body composition and injury incidence among Malaysian professional football players, addressing a gap in current research on this topic. **Methods:** A prospective cohort study was conducted on eighty-one professional football players from a single club during the 2023 Malaysian football season. Pre-season assessments included demographic data collection, anthropometric measurements (including body composition), and medical screenings. Injury occurrences were monitored and recorded throughout the season. The Mann-Whitney test was used to analyze body composition differences between injured and non-injured players. **Results:** Pre-season assessments revealed mean BMI of 22.7 kg/m², body fat mass of 10.2 kg, body fat percentage of 14.8%, and skeletal muscle mass of 33.0 kg. Throughout the season, 86 injuries were documented, resulting in a total injury incidence rate of 3.56 per 1000 hours (46.62/1000 H during matches and 1.56/1000 H during training). Injured players exhibited statistically significant higher body fat mass (10.8 versus 8.9 kg; $P = 0.012$) and body fat percentage (15.4 versus 13.1%; $P = 0.028$) compared to non-injured players. Multivariate regression analysis indicated that body fat percentage weakly predicts injury risk. **Conclusion:** This study highlights body composition, particularly higher body fat mass and percentage, as potential risk factors for injuries among professional football players. Understanding these intrinsic risks is crucial for developing targeted injury prevention programs aimed at optimizing player performance and reducing injury incidence.

A Scoping Review of Basic Golf Knowledge for Beginners

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Objectives: This scoping review synthesizes current literature on the use of golf in educating beginners about biomechanics of the golf swing, injury prevention, and swing improvement techniques. **Methods:** Following Arksey and O'Malley's framework for scoping reviews (2005), a systematic search was conducted on the PubMed database for studies published within the last ten years, focusing on golf swing biomechanics, golf-related injuries, and muscle engagement in golf. Inclusion criteria included English language and availability of full text, while exclusion criteria comprised non-English language and incomplete data. Two independent reviewers evaluated titles and abstracts, resulting in the inclusion of 38 studies meeting all criteria. **Results:** The review identifies a growing body

of research on golf swing kinematics, delineating four key phases: Address, Backswing, Downswing, and Follow-through. Overuse injuries constitute the majority (82.6%) of golf-related injuries, predominantly manifesting as back pain and wrist injuries. Upper body muscles such as pectoralis major, latissimus dorsi, external obliques, erector spinae, and flexor carpi ulnaris, along with lower body muscles including biceps femoris, gluteus maximus, and vastus lateralis, play significant roles during the golf swing. Understanding these muscle dynamics can aid in improving performance and reducing injury risk. **Conclusion:** This scoping review provides valuable insights into golf biomechanics, injury patterns, and the involvement of major muscle groups during the golf swing. These findings underscore the importance of integrating biomechanical knowledge into golf training programs aimed at enhancing performance and mitigating injury risks among beginners.

Effectiveness of Hydrotherapy in Enhancing Lower Limb Motor Function in Children with Spastic Cerebral Palsy: A systematic review

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Objectives: Spastic cerebral palsy (SCP) significantly impacts children's mobility and daily activities due to increased muscle tone resulting from central nervous system damage. Hydrotherapy uniquely integrates physical factors and exercise therapy. This study systematically reviews the efficacy of hydrotherapy in improving lower limb motor function among children with SCP. **Methods:** A comprehensive literature search from January 2017 to December 2023 was conducted across PubMed, Google Scholar, CNKI, and Wanfang Data using keywords "Hydrotherapy," "Aquatic Therapy," combined with "Spastic cerebral palsy" and "brain paralysis." Eligible studies included hydrotherapy interventions for children aged 1-14 with SCP, assessing at least one lower limb motor function outcome. Data extracted encompassed study design, outcomes, aquatic program specifics (type, frequency, duration, intensity). **Results:** Twenty-one English randomised controlled trials meeting inclusion criteria demonstrated good research quality. Swimming, particularly utilising the Halliwick method, emerged as a prominent hydrotherapy modality, effectively enhancing independent mobility. **Conclusion:** Hydrotherapy proves to be a valuable rehabilitative strategy for reducing high muscle tone in the lower limbs of children with cerebral palsy, thereby enhancing mobility and quality of life. Swimming, in particular, not only promotes muscle relaxation but also fosters coordination, making it an engaging and effective intervention for improving motor function in this population. By enhancing motor skills and overall well-being, hydrotherapy, especially through swimming, empowers children with cerebral palsy to achieve significant developmental milestones.

Effectiveness on Neurofeedback Training Toward Awareness and Performance Enhancement on Elite Athletes

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Objectives: High-performance athletes require effective training methods to enhance their performance. Neurofeedback training (NFT) has shown promising effects on sports performance in recent years, although it remains underutilised in Malaysia. NFT aims to optimize performance by enhancing voluntary control over stimuli, sounds, sensory inputs, and situational awareness. This study investigates the effectiveness of NFT in increasing the frequency and duration of peak performance under normal training conditions and during championship participation. **Methods:** This study employed an 8-week intervention period leading up to the World Tenpin Bowling Championship. Elite athletes participating in the championship underwent NFT sessions at least three times per week, with situational simulations provided after a two-week familiarization period. Psychological demands were integrated into daily training routines and tailored to specific skill and competitive requirements. Each NFT session lasted approximately 20–35 minutes, and data were collected directly from the neurofeedback device used. **Results:** NFT training demonstrated a reduction in brain activation and increased states of calmness and relaxation. Improved performance consistency and emotional management during competition were noted with NFT support. **Conclusion:** Neurofeedback training proves beneficial in enhancing sports performance by improving mental endurance, flexibility, and self-awareness. It provides athletes with tools to optimise their performance potential and manage competitive pressures effectively. As a result, NFT stands out as an effective method for enhancing performance and promoting self-awareness among elite athletes.

Mood Classification Among National Athletes of Skill Sport

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Objectives: Mood plays a crucial role in sports performance, particularly in skill sports like archery and shooting at the national level. This study aims to identify and analyze the mood states of national athletes during training sessions in these skill sports. **Methods:** Nineteen national athletes participated, including archery (n = 8), shooting (n = 6), and para-archery (n = 5). The mean age was 21.84 years, with an average of 7.32 years of sport experience. Emotions were assessed using a purposive sampling method with 24 categorised emojis from the Brunel Mood Scale (BRUMS) questionnaire. Descriptive analysis was employed for statistical evaluation. **Results:** The majority of athletes reported higher levels of vigor (36%) and lower levels of anger (5%). Among shooting athletes, fatigue was most prevalent (n = 16), followed by vigor (n = 13). Anger (n = 1) and depression (n = 1) were the least frequently reported emotions. Archery athletes exhibited similar trends with fatigue (n = 16) and vigor (n = 15) being prominent. Confusion was least reported (n = 3). Para-archery athletes showed the highest frequency of vigor (n = 10) and the lowest incidence of negative mood states. **Conclusion:** The emoji-based mood scale proved effective in monitoring athletes' well-being and performance during training and competition. Coaches and scientists can utilize these findings to better understand and manage athletes' mood fluctuations, thereby optimizing their performance outcomes. Awareness of mood states is crucial for athletes and coaches to mitigate potential performance interferences and strive towards achieving peak performance.

Professional Identity Influencing Universities Female PE Teacher Professional Development

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Objective: This study examines the relationship between professional identity and the professional development of female physical education (PE) teachers in colleges and universities, identifying key influencing factors. **Methods:** A quantitative research approach was employed, involving 300 female PE teachers (age: 35 [25–55] years) from various higher education institutions including comprehensive universities, physical education colleges, and normal colleges. Participants completed a questionnaire comprising a professional identity scale, a career development satisfaction scale, and demographic questions. A total of 280 valid responses were analysed after a three-week recovery period, yielding an effective response rate of 93.3%. Data were analysed using descriptive statistics, correlation analysis, and regression analysis. **Results:** Regression analysis indicated that the model explained 45% of the variance in career development (adjusted $R^2 = 0.45$). The overall significance test of the model ($F [3, 276] = 75.36; P < 0.001$) confirmed its statistical significance. Professional identity and the gender atmosphere significantly predicted career development outcomes. Higher levels of professional identity were positively correlated with career satisfaction, career motivation, and career commitment among female PE teachers. Professional identity directly influenced career satisfaction and retention intentions, while also indirectly impacting professional development and career achievements. **Conclusion:** This study underscores the importance of fostering a positive and supportive environment, ensuring equal developmental opportunities, and enhancing the professional identity of female PE teachers in universities. These factors are pivotal in promoting the professional development, job satisfaction, and retention of female physical education professionals.

Examining the Effects of Table Tennis Rhythm Training on the Psychological Well-being of Chinese Table Tennis Players: A systematic review

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Objectives: Table tennis significantly influences the psychological well-being of players. While existing research has focused primarily on the psychological impacts of technical and tactical aspects, the role of rhythm in table tennis remains underexplored. This systematic review aims to investigate the effects of table tennis rhythm training on the psychology of Chinese table tennis players by synthesizing relevant literature. **Methods:** A systematic search was conducted from January 2019 to February 2024 across databases including Scopus, PubMed, Web of Science, and Google Scholar. Keywords such as "table tennis", "rhythm training", and "athlete psychology well-being" were used. A total of 28 studies were initially identified, with 8 articles meeting inclusion criteria, involving 330 players. The literature covers rhythm definitions, variations, control methods, training techniques, the influence of rhythm rules and characteristics, strategic positioning, use of pauses, and psychological factors affecting rhythm. **Results:** Research on table tennis rhythm highlights its crucial role in enhancing sports proficiency, technical skills, performance outcomes, and mental well-being of athletes. **Conclusion:** Rhythm training in table tennis has shown potential to improve athletes' psychological stability. However, due to the complexity of rhythm systems, further high-quality research is necessary to fully understand its effects on athlete psychology. Continued investigation in this area is warranted to advance knowledge and optimize training strategies.

Effects of Mental Imagery Training on Sport Performance: A systematic literature review

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Objectives: Imagery is a widely recognised mental skill in sports science known for its positive impact on enhancing athletic performance, mental skills, and injury rehabilitation. This systematic review aims to assess the effects of mental imagery training on athlete psychology and sport performance through an examination of existing literature. **Methods:** A systematic search was conducted across PubMed, ScienceDirect, and Scopus databases. Inclusion criteria encompassed studies employing imagery training within a sports context and written in English. **Results:** Sixteen studies met the inclusion criteria and were included in this review. Imagery training consistently demonstrated beneficial outcomes on both sport performance and the psychological state of athletes. Some studies indicated that combining mental imagery with physical practice yielded superior results compared to using imagery training alone. Additionally, research explored integrating imagery training with other mental skills or specific forms of imagery training, suggesting opportunities for comprehensive training program development. **Conclusion:** This comprehensive review confirms that imagery training positively affects sport performance and athlete mental well-being. However, further research is needed to fully understand how imagery influences cognitive representation and its intricate relationship with performance enhancement.

Anterior Cruciate Ligament Graft Impingement Following Reconstruction: A case report of a 37-year-old recreational footballer

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Objectives: This case report discusses anterior cruciate ligament (ACL) graft impingement, a rare but potentially debilitating issue successfully treated conservatively with a rehabilitation program. **Methods:** We present the case of a 37-year-old recreational athlete who underwent ACL reconstruction after sustaining a knee injury while playing football. Following surgery, he underwent an accelerated postoperative rehabilitation program and safely returned to sports activities 9 months later. However, he experienced a recurrent knee injury 4 months after returning to football, presenting with a new episode of catching sensation and deep flexion knee pain. Imaging studies revealed distorted ACL graft with evidence of graft impingement, a complication not extensively documented in the literature. **Results:** The patient underwent an intensive rehabilitation program comprising a relative resting period followed by a gradual increase in intensity of lower limb strengthening exercises and running program, resulting in a safe return to sports 8 weeks later. **Conclusion:** Graft impingement following ACL reconstruction is a rare but significant complication that can lead to persistent symptoms. Timely recognition and appropriate management are crucial for optimising patient outcomes. This case report contributes to the existing literature on ACL reconstruction complications, emphasizing the importance of recognizing and addressing graft impingement in postoperative rehabilitation for a safe return to sports activities.

Musculoskeletal Risk Factors for Low Back Pain Among Indian National Rowers

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Objectives: Low back pain (LBP) is prevalent among rowers, significantly affecting performance and career longevity. Its multifactorial etiology includes biomechanical aspects, training regimens, ergonomic factors, and individual predispositions. Musculoskeletal (MSK) factors such as restricted hamstring and lateral flexion range of motion (ROM), reduced lumbar lordosis, and lower back muscle endurance are identified as key risk factors for LBP. This study aims to analyze these MSK risk factors contributing to LBP among Indian national rowers. **Methods:** Twenty national male and female rowers underwent musculoskeletal screening by a Sports Medicine Doctor and Sports Physiotherapist at a private sports science facility. Key MSK factors associated with LBP, including hip and spine ROM and lower back muscle endurance, were measured. Functional Movement Screening (FMS) test battery was conducted according to FMS™ guidelines. Injury history screening for low back symptoms utilised a standardised questionnaire. Descriptive analysis was performed on the collected data. **Results:** Among the 20 rowers, 6 reported a history of LBP. All injured rowers exhibited hamstring tightness, core weakness, reduced hip mobility, and lower than acceptable FMS scores. Components of FMS such as deep squat, hurdle step, straight leg raise, and rotary stability showed lower scores in injured rowers. **Conclusions:** This study underscores the importance of musculoskeletal screening for early identification of LBP risk factors in rowers. Addressing these factors through targeted corrective strategies and interventions could mitigate low back injuries, thereby prolonging rowers' careers.

Navigating Diagnostic Ambiguity: Unravelling cardiorespiratory dynamics with CPET in complex pathologies

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Objectives: Cardiopulmonary Exercise Testing (CPET) is crucial in resolving diagnostic uncertainties, especially following inconclusive organ-specific investigations. **Methods:** We present the case of a 44-year-old Indian woman with progressive breathlessness since 2015, exacerbated post her husband's passing, culminating in a syncopal episode during stair-climbing in 2021. Initial diagnosis at the National Heart Institute (IJN) revealed sinus venosus atrial septal defect (ASD) with partial anomalous pulmonary venous drainage and mild pulmonary hypertension, leading to successful surgical repair in August 2021. Post-operative echocardiography showed reassuring ejection fraction (EF: 61%), but recurrence of symptoms prompted further evaluation. Despite conclusive respiratory investigations including repeated spirometry, CTPA, and HRCT thorax showing no significant abnormalities except basal left lobe plate atelectasis, concerns persisted due to an apparent enlarged pulmonary trunk. Repeated echocardiography at IJN showed an EF of 57% with no residual ASD. Subsequent right heart catheterisation revealed no evidence of pulmonary hypertension. **Results:** Referral for CPET revealed reduced exercise capacity with mild ventilatory inefficiency, likely due to hyperventilation, suggesting symptoms attributed to deconditioning and anxiety rather than overt cardiorespiratory pathology. This distinction was pivotal for guiding management, with targeted aerobic conditioning exercises recommended for symptom improvement. A repeat CPET assessment in 6 months was advised for objective progress monitoring. **Conclusion:** These findings underscore the complex interplay between cardiac pathology, respiratory function, and physical deconditioning in determining exercise tolerance and symptomatology. CPET plays an emerging role in unravelling diagnostic ambiguities, facilitating tailored interventions for optimal patient outcomes.

Incidence of Injuries and Illnesses Among Negeri Sembilan Athletes During Sukan Malaysia 20th Games 2022

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Objectives: Injury and illness surveillance programs during multi-sport events are crucial for injury prevention strategies. Sukan Malaysia (SUKMA) is a biennial national event featuring multiple sports. This study aims to describe the incidence and characteristics of injuries and illnesses among Negeri Sembilan athletes during SUKMA 2022. **Methods:** This retrospective cross-sectional study involved accessing the Negeri Sembilan SUKMA 2022 injury and illness data registry from September 10, 2022, to September 24, 2022. Data on all medical encounters of Negeri Sembilan SUKMA 2022 athletes were extracted. **Results:** A total of 387 Negeri Sembilan athletes participated in SUKMA 2022, comprising 145 women (37.4%) and 242 men (62.5%). There were 102 reported injuries, resulting in an incidence of 26.4 injuries per 100 athletes over 15 days. Sixteen athletes (4.1%) sustained two or more injuries, while 371 athletes (95.9%) reported a single injury. Sports with the highest injury rates were hockey (n = 24, 23.5%), cricket (n = 10, 11.5%), and Wushu (n = 9, 8.8%). Female athletes had a higher injury incidence of 14.7 injuries per 100 athletes compared to male athletes with 11.9 injuries per 100 athletes. Thirteen illnesses were reported, with an incidence of 3.4 illnesses per 100 athletes. There was no reported time loss from sports due to illness. The respiratory system was the most commonly affected (n = 6, 46.1%), followed by the skin (n = 2, 15.4%). **Conclusion:** The incidence of injuries among Negeri Sembilan SUKMA 2022 athletes was higher compared to the Tokyo 2020 Olympics, whereas the incidence of illnesses was similar to the Tokyo 2020 Summer Olympics.

Pilot Study-Estimated VO₂max via Modified Harvard Step Test in Anterior Cruciate Ligament Injury Patients Undergoing Pre-Op Rehabilitation

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Objectives: Anterior Cruciate Ligament (ACL) injuries significantly impact physical function and psychological well-being, potentially leading to post-traumatic osteoarthritis, increased body mass index (BMI), and reduced cardiorespiratory fitness. Cardiorespiratory fitness, indicated by VO₂max, is crucial for assessing fitness capacity. This study aims to compare VO₂max scores between ACL injury

patients in early and late phases of rehabilitation. It is part of a larger study to evaluate VO₂max post-ACL reconstruction using the Modified Harvard Step Test (MHST). **Methods:** A prospective study was conducted at the Sports Medicine Gym, Hospital Tuanku Ja'afar, 2023. Data from 20 patients undergoing pre-ACL reconstruction rehabilitation were analysed. Patients were categorised into two groups based on time since injury (<6 months and >6 months). Participants followed rehabilitation guidelines from the University Malaya Medical Centre Sports Medicine ACL Rehabilitation program. VO₂max was estimated using the MHST. **Results:** The mean age of participants was 21.9 ± 4.3 years. The overall mean VO₂max was 43.2 mL/kg/min. Participants in the <6 months group had a mean VO₂max of 35.4 ± 1.8 mL/kg/min, while those in the >6 months group had a mean of 49.0 ± 5.8 mL/kg/min. Significant differences in VO₂max values were observed between the two groups. **Conclusion:** Early ACL injury stages typically result in reduced cardiorespiratory fitness due to limitations in aerobic exercise capacity. Progressive rehabilitation can enhance cardiorespiratory fitness, support return to sports, and mitigate postoperative morbidity.

Cardiac Rehabilitation Assessments for Long COVID Myocardial Injuries

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Objectives: This article explores the essential assessment methods for cardiac rehabilitation (CR) in patients with long COVID-associated myocardial injuries, aiming to alleviate symptoms and enhance quality of life. **Methods:** A comprehensive literature search was conducted using Web of Science and PubMed databases with keywords "COVID-19," "myocardial injury," "cardiac rehabilitation," and "assessment." Relevant studies were identified and summarised to outline effective CR assessment strategies. **Results:** Clinical examinations for long COVID myocardial injury involve detailed medical history, symptom assessment, troponin and inflammatory marker testing, electrocardiography, and echocardiography. Cardiovascular Magnetic Resonance (CMR) confirms diagnoses in cases with abnormal results or persistent symptoms, while Two-dimensional speckle tracking echocardiography (2D-STE) detects myocardial injuries. CR assessments include evaluating exercise capacity (e.g., 6-minute walk test), physical function (e.g., short-term fitness tests, strength assessments), and activities of daily living. Comprehensive cardiac diagnosis, cardiovascular disease risk factor stratification, and cardiopulmonary exercise testing (CPET) are essential. CPET and ambulatory electrocardiograms assess patients with persistent symptoms despite normal CMR findings. **Conclusion:** Effective CR evaluation for long COVID myocardial injuries requires thorough clinical assessments and rehabilitation evaluations, ensuring tailored programs that address cardiac health and overall well-being in collaboration between clinicians and therapists.

A Systematic Review on the Advancements in Rehabilitation Strategies for Glenohumeral Subluxation in Stroke Patients

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Objectives: Stroke significantly impacts survivors' quality of life and functional abilities, often leading to complications such as Glenohumeral Subluxation (GHS). This systematic review aims to assess recent advancements in rehabilitation strategies for GHS in stroke patients, highlighting treatment modalities and outlining future research directions. **Methods:** A comprehensive literature search spanning January 2018 to December 2023 was conducted using PubMed, Google Scholar, X-MOL, and CNKI databases. Keywords included "stroke" or "cerebral apoplexy," "glenohumeral subluxation," and "Rehabilitation Therapy." Selected studies were evaluated for authorship, publication date, study design, intervention methods, assessment tools, and outcomes. **Results:** Thirty studies were reviewed, focusing on causes of GHS post-stroke and various rehabilitation techniques. Interventions ranged from optimal limb positioning, shoulder protective devices, and physical agent therapy to exercise regimens and traditional Chinese rehabilitation methods. Innovative approaches included biofeedback integrated with virtual technology and Brain-Machine Interface therapies. **Conclusion:** Current research primarily compares upper limb function recovery before and after GHS treatment following stroke. However, there is a notable gap in comprehensive functional recovery studies and tailored rehabilitation strategies specifically targeting hemiplegic patients with GHS. Future research should explore effective treatment protocols, advanced rehabilitation modalities, and personalised interventions to optimize outcomes and enhance the quality of life for individuals experiencing secondary GHS post-hemiplegia.

Anatomic Morphometry of the Coracoid Process and Lateral Clavicle for the Management of Glenoid Bone Loss: A 3-dimensional analysis in Korean population

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Objectives: This study aims to analyze the anatomical morphometry of the coracoid process and distal clavicle in the South Korean population, providing insights for managing glenoid bone loss. **Methods:** A total of 66 cadaveric coracoids and clavicles (32 males and 34 females) underwent continuous 1.0 mm slice computed tomography (CT) scans. Three-dimensional models of the coracoid process and clavicle were reconstructed using Mimics® software. Measurements included length, width, and height of the coracoid process, as well as the width and height of the clavicle 10 mm from its lateral tip. Correlations between these measurements and demographic data were analysed. **Results:** The mean coracoid length was 18.1 ± 1.5 mm, width was 14.8 ± 1.5 mm, and height was 10.8 ± 1.4 mm. The width and height of the clavicle 10 mm from its tip were 20.0 ± 2.3 mm and 11.10 ± 1.38 mm, respectively. Females had smaller measurements than males across all parameters. Height showed a significant positive correlation with all measured parameters ($P < 0.05$). An equation was derived to estimate coracoid length: coracoid length (in mm) = 11.70 + (0.041 * height) + 1.86 (for males). Similarly, an equation for estimating the width of the clavicle 10 mm from its tip was developed: width = 0.16 * height + 3.176 (for males). **Conclusion:** The morphologies of the coracoid process and distal clavicle exhibit significant correlations with gender and height in the Korean population. The findings suggest that the distal clavicle could be a viable option for reconstructing instability-related glenoid bone loss in Asian populations, emphasizing the importance of anatomical considerations in surgical planning. Further research is warranted to validate these findings and explore their applicability in clinical settings.

Does the Combination of Platelet-Rich Plasma and Cyclic AMP Improve Tendon Morphology, IGF-1 and bFGF Expression in a Rabbit Model of Achilles Tendinopathy?

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Objectives: This study aimed to investigate the effects of combining platelet-rich plasma (PRP) with cyclic adenosine monophosphate (cAMP) on tendon tissue morphology, insulin-like growth factor 1 (IGF-1), and basic fibroblast growth factor (bFGF) expression in a rabbit model of Achilles tendinopathy. **Methods:** Forty New Zealand male white rabbits were divided into a model group (32 rabbits) and a blank control group (8 rabbits). The model group received injections of prostaglandin E above the Achilles tuberosity for 4 weeks to induce Achilles tendinopathy, while the control group received saline injections. Subsequently, the model group was further divided into four subgroups: PRP group (received autologous PRP injections), cAMP group (received cAMP suspension injections), combined group (received a mixture of PRP and cAMP injections), and model control group (received saline injections). Injections were administered twice every 3 weeks for a total of 6 weeks. Achilles tendon tissue specimens were collected for histomorphometric examination, IGF-1, and bFGF detection. **Results:** IGF-1 expression in the combined group was significantly higher compared to the model control group ($P < 0.05$). The histomorphometric examination showed improvements in tendon tissue morphology in the combined group compared to the model control group. **Conclusion:** The study concludes that PRP enhances the proliferation and differentiation of local tendon stem cells and shows promising clinical effects in early-stage tendinopathy. Additionally, the combination of cAMP injection further increases the expression levels of IGF-1 and bFGF in tendon cells, leading to improved tissue morphology and promoting the repair of tendinopathy. These findings suggest a potential synergistic effect of PRP and cAMP in treating Achilles tendinopathy, warranting further research to validate these results and explore their clinical applicability.

Effects of Customised, Comprehensive Exercise Therapy on Knee Joint Function Among Older Adults with Knee Osteoarthritis During Stairs Climbing

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Objectives: This study aimed to investigate the effects of customised, comprehensive exercise therapy on knee joint function in older adults with knee osteoarthritis (KOA), particularly during stairs climbing. **Methods:** Sixty-six older adults diagnosed with KOA were randomly assigned to three groups: the exercise group (EG, $n = 22$, mean age: 67.0 ± 2.7 years, mean BMI: 25.7 ± 2.3 kg/m²), the physiotherapy group (PG, $n = 22$, mean age: 67.5 ± 4.4 years, mean BMI: 25.7 ± 3.0 kg/m²), and the control group (CG, $n = 22$, mean age: 65.7 ± 1.9 years, mean BMI: 27.4 ± 2.1 kg/m²). The EG received an 8-week exercise intervention consisting of proprioceptive neuromuscular facilitation, muscle strength training, and gait training, with sessions lasting 1 hour, 3 times per week. The PG received standard physical therapy sessions, while the CG underwent a health education series. Outcome measures included pain assessed via Visual Analogue Scale, walking speed, knee joint angles (flexion), and knee joint moments (extension and abduction) measured using a motion capture system and force plate. Measurements were taken before and after the intervention period. Data were analysed using two-way repeated measures ANOVA to assess interactions between time and group. **Results:** Significant interactions (time × group) were observed for pain scores, walking speed, knee flexion angle, knee extension moment, and knee abduction moment ($P < 0.05$). Specifically, the EG showed improvements in pain reduction, increased walking speed, greater knee flexion angle during stair climbing, and decreased knee abduction moment compared to both PG and CG. **Conclusion:** This study concludes that an 8-week customised, comprehensive exercise therapy program is effective in improving knee joint function among older adults with KOA, particularly during stairs climbing. The intervention resulted in reduced pain, increased walking speed, improved knee flexion angle, and reduced knee abduction moment. These findings highlight the potential benefits of tailored exercise interventions in managing knee osteoarthritis and enhancing functional abilities in daily activities.

Effects of Swimming Rehabilitation Exercises on Rehabilitation of Children with Cerebral Palsy

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Objectives: This study aimed to evaluate the impact of scientific aquatic training on motor dysfunction in children with cerebral palsy, with a focus on improving their well-being and informing future rehabilitation strategies. **Methods:** Ten children with cerebral palsy from Longgang Special School in Shenzhen were selected as experimental subjects, following institutional ethical approval and specific inclusion criteria. A control group received standard care, while the experimental group participated in a 16-week swimming training program. Assessments were conducted to compare outcomes between the two groups. **Results:** The swimming rehabilitation exercise significantly improved balance ability and cognitive communication abilities ($P < 0.05$). Moreover, there were notable improvements in psychological adaptation and aquatic balance control ability ($P < 0.01$). However, fine motor control and lower limb strength did not show significant improvement, suggesting the need for targeted interventions in these specific areas. **Conclusion:** This study underscores the potential of swimming rehabilitation exercises to enhance balance and cognitive communication skills in children with cerebral palsy. Future research should focus on developing specialised training movements to address fine and coarse motor abilities comprehensively. Additionally, investigations into optimal training frequencies for strength enhancement are warranted. These findings contribute valuable insights into designing more effective and tailored rehabilitation programs for children with cerebral palsy.

A Study on the Evolutionary Dynamics of China's National Traditional Sports Policies from the Perspective of Multi-Source Flow Theory

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Objectives: In the current phase of development, strengthening theoretical policy research and enhancing the scientific basis for decision-making are crucial prerequisites for advancing comprehensive development. This study aims to comprehensively and systematically analyze the root causes of issues, key aspects of policy formation, and the surge of political momentum to establish a more complete and in-depth research framework. **Methods:** Adopting a multi-source flow perspective, this study combines research methods such as documentary analysis and logical analysis. **Results:** The evolution of China's national traditional sports policies is influenced by diverse factors, including the incomplete realization of the profound meaning of the Chinese national cultural rejuvenation, the selective emphasis on "focus events" capturing public attention, and the challenges evident in current policy practices. The formation of policies involves a complex network stemming from government guidance, contributions from experts and scholars, and the demands expressed by relevant interest groups. Politically, the driving forces behind policy evolution include the advanced governance concepts of the Party and the state, the influence of public opinion, and the imperative to strengthen national unity and foster a cultural renaissance. **Conclusion:** The convergence and interaction of issues, political imperatives, and policy dynamics in China's national traditional sports policies have created a strategic "policy window" that facilitates significant shifts in traditional Chinese national policies.

Drugs and Doping in Sports

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Objectives: This study aims to investigate the prevalence, types, motivations, and consequences of drug use and doping in sports, focusing on understanding the underlying factors driving these behaviors. **Methods:** A comprehensive literature review was conducted, encompassing peer-reviewed research articles, review papers, and reports from relevant sports organizations and anti-doping agencies. Studies examining drug use and doping behaviors among athletes, as well as their motivations, consequences, and attitudes towards anti-doping regulations, were included. Data extraction and synthesis identified common themes and patterns across studies. **Results:** The review revealed a widespread prevalence of drug use and doping across various sports, from amateur to professional levels. Athletes often turn to performance-enhancing drugs (PEDs) to gain a competitive advantage, improve physical performance, and expedite recovery. Motivations for doping include the pressures of competition, financial incentives, and the pursuit of fame and recognition. However, doping poses significant health risks, including cardiovascular complications, hormonal imbalances, and psychological effects. Moreover, the use of PEDs undermines fair play and sportsmanship, eroding public trust in the integrity of sports competitions. **Conclusion:** The findings underscore the pervasive nature of drug use and doping in sports and highlight the complex factors influencing athletes' decisions. Addressing doping requires a multifaceted approach involving education, prevention, detection, and enforcement measures. Strategies aimed at promoting ethical conduct and upholding fair play are essential for protecting the integrity of sports and ensuring the health and well-being of athletes. Collaboration among sports organizations, anti-doping agencies, healthcare professionals, and athletes themselves is crucial in tackling this persistent issue effectively.